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POLYCHAETES RECORDED NEAR TWO PULP MILLS ON THE COAST OF NORTHERN BRITISH COLUMBIA: A PRELIMINARY TAXONOMIC AND ECOLOGICAL ACCOUNT

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and
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FIGURE 1: *Map of British Columbia showing collection sites of Ocean Falls and Swanson Bay.*

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ABSTRACT

Two locations on the coast of northern British Columbia were sampled during the years 1972 to 1975 in an attempt to determine the long term effects of pulp mill wood waste on marine benthic communities. Industrial activity at Swanson Bay ceased about 1935, but Cousins Inlet was still receiving wastes from a groundwood plant in 1975. Polychaetous annelids were dominant in most samples from both locations.

Dissolved oxygen in the bottom waters of Cousins Inlet were much improved when compared with previous surveys made in 1962 when a sulfate and sulfite mill was operating. Natural sediments in Ocean Falls Harbour at the head of the inlet were completely covered with wood chips, fibers and paper waste. Ninety-one species of polychaetes were identified in 26 samples from eight stations, with stations near the mouth of fjord being most productive and those in the harbour virtually barren.

Bottom oxygen in Swanson Bay was much higher than in Cousins Inlet, due to strong tidal currents in Graham Reach. Wood waste was well mixed with natural sediments (sand, shell, gravel). Eight samples from two stations yielded 126 species of polychaetes, indicating that the infauna of such channels may be among the most diverse benthic polychaete communities recorded.

Of the 166 taxa of polychaetes collected from these two locations, 34 appear to be new to British Columbia, and six may be new to science. Certain new records may be due to introductions from ship traffic, especially *Pionosyllis uraga* Imajima (Syllidae) from Japan, and *Tharyx tessalata* Hartman (Cirratulidae) from California.

RÉSUMÉ

Pendant les années 1972 à 1975, quelques échantillons furent récoltés dans deux régions de la côte nord de la Colombie britannique, afin de tenter de déterminer les effets à long terme des rebuts d'usine, de pâte à papier dans les communautés bentiques marins. Les activités industrielles à la Baie Swanson cessèrent vers 1935, bien qu'une usine d'Ocean Falls à Cousins Inlet ait continué à fonctionner en 1975. Les annélides polychètes étaient dominantes dans la plupart des échantillons ramassés dans ces deux régions.

Nous avons constaté que les eaux profondes de Cousins Inlet contenaient beaucoup plus d'oxygène que lors d'études précédentes faites en 1962 lorsque l'usine de sulfure fonctionnait. Des sédiments naturels situés dans le havre d'Ocean Falls furent complètement couverts de morceaux, de fibres de bois et de pâte à papier. Quatre-vingt-onze (91) espèces de polychètes dans vingt-six (26) échantillons de huit stations furent identifiées. Les stations les plus près de l'embouchure du fiord étaient les plus productives tandis que celles du havre étaient presque stériles.

A cause des marées fortes de Graham Reach, il y avait beaucoup plus d'oxygène dans les profondeurs de la Baie Swanson que dans Cousins Inlet. Les rebuts de bois étaient bien mélangés aux sédiments naturels (sable, cailloux, coquillages). Dans huit échantillons de deux stations, nous avons trouvé cent vingt-six (126) espèces de polychètes indiquant que cet ensemble est peut-être un des communautés les plus diversifiés mentionnés dans le monde.

Trente-quatre (34) des cent soixante-six (166) espèces de polychètes trouvés dans ces deux régions apparaissent être nouvelles à la Colombie-Britannique et peut-être à la science.

Quelques unes de ces espèces auraient été introduites grâce au trafic maritime, particulièrement les espèces *Pionosyllis uraga* Imagjima (Syllidae) du Japon, et *Tharyx tessalata* Hartman de la Californie.

ACKNOWLEDGEMENTS

Thanks are due to a number of colleagues who participated in field work, especially N. McDaniel and G. Christie, and to the officers and crew of CFAV LAYMORE. Special thanks are due to Mr. Alex Reid, former First Mate of the LAYMORE, who pointed out the abandoned pulp mill at Swanson Bay.

Initial sorting of the Ocean Falls samples was performed at the former Canadian Oceanographic Identification Centre, National Museum of Natural Sciences, by James Pang, Marty Bueno di Mesquita, Ann Lanz and Fred McFarland. Shiona Whyte and Brian McRory assisted in the laboratory at the Pacific Environment Institute and with the statistical analyses. Dr. Rita O'Clair verified some of the polychaete identifications prior to leaving her position as Curator at the National Museum of Natural Sciences, and Dr. Alex Peden and Phil Lambert were very helpful during the week that was spent by JAF at the British Columbia Provincial Museum, comparing specimens from this collection with those identified by Katherine Hobson. Dr. Karl Banse kindly provided copies of manuscript keys to the sedentariate polychaetes which proved especially useful in dealing with some difficult families. Dr. J.W. Wacasey checked and added to the distribution Table (Appendix C).

The Northeast Pacific Records cited in the systematics section would not have been anywhere near as complete as they are without the work of Diana Laubitz, Dr. Nishi Sharma and Penny Adams on the Bibliography of Canadian Aquatic Invertebrates. This project is now in the process of computerization and will be a very useful and powerful tool for publications such as this one.

Early drafts of this manuscript were read and criticized by our colleagues, Mrs. Diana Laubitz and Dr. C.T. Shih, NMNS, who provided many helpful comments. The final version was reviewed by Dr. E.L. Bousfield, NMNS, and Dr. Kristian Fauchald of the United States National Museum, whose recommendations have been very useful in clarifying some of our findings. We are, moreover, deeply indebted to the long-suffering patience of Mr. Chuck Gruchy, Chief of the Invertebrate Zoology Division, NMNS, who has read and re-read it, and encouraged us at every stage of the long gestation of this manuscript.

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INTRODUCTION

This report provides taxonomic results and distributional data on polychaetes obtained from a series of benthic surveys conducted in the vicinity of two pulp mills on the coast of northern British Columbia (Figure 1). At one location, Ocean Falls at the head of Cousins Inlet, a sulfite and kraft pulp mill had been in operation since 1912 but stopped operations in 1967. The remaining activity, a 280 ton per day groundwood plant was projected to close down in November 1972, and one of us (CDL) began a study to document recolonization of Cousins Inlet by benthic infauna. In April 1973, the mill was bought by and subsequently operated for the provincial government, and it was not feasible to conduct the recolonization study. The last cruise to Cousins Inlet was made in November 1975. On two of the sampling trips, samples were obtained at Swanson Bay, on Graham Reach, about 80 km northwest of Ocean Falls. A sulfite pulp mill and sawmill operated here from about 1909 to 1935 (B.C. Archives information) and it was thought that data from this site might provide some comparative information on the long-term prospects of recovery from pulp mill waste in B.C. waters.

Detailed studies of the smaller invertebrates from the coast of northern British Columbia are almost non-existent, so we are here reporting preliminary information on the taxonomy and distribution of the prominent species in the collections from Swanson Bay and Ocean Falls. The analysis of the samples, which were obtained with grabs, was carried out by the first author at the National Museum of Natural Sciences, Ottawa. Early in the work, it became evident that identification of the organisms was going to be very complex. Many of the invertebrates had never been reported from British Columbia before and some were possibly new to science. Species composition of the samples from Swanson Bay was incredibly diverse, especially the polychaetes, and it is this taxon that forms the subject of this report.

STATION LOCATIONS

At Ocean Falls, sampling locations generally corresponded with the water quality stations established by Waldichuk (1962), and are shown in Figure 2 and listed in Table 1. The stations are aligned along the axis of the inlet, and are more frequent in the harbour area. Attention was focussed on stations near Coolidge Point (stations O-8 to O-9), as this area

represents a transition habitat from heavily polluted to natural sediments.

Stations at Swanson Bay are shown in Figure 3 and listed in Table 2. Stations M and J were chosen for detailed analysis as sediments at these locations contained wood waste, estimated to be 40 to 60 years old, and it was of interest to see which species were living in, or on, this material.

DESCRIPTION OF STUDY AREAS

A. Ocean Falls

The town of Ocean Falls is located at the head of Cousins Inlet, which leads north off Fisher Channel (Figure 2). Cousins Inlet is approximately 10 km in length, with an average width of about 1 km. Depth ranges from about 10 m, in Ocean Falls harbour, to 200 m where Cousins Inlet joins Fisher Channel. Sediment composition is a reflection of distance from the pulp mill (Table 1). The harbour bottom is completely covered with wood fibre, charcoal, and paper wastes, as recorded previously (Waldichuk 1962). Wood waste from two stations in this survey (Stations O-10, O-14), was identified as 50% spruce and 50% hemlock (identifications courtesy of Dr. Bruce Kellogg, Western Forest Products Laboratory, now Forintek Canada). At Coolidge Point (Figure 2) sediments begin to shift to natural substrates of mud and silt, mixed with "natural" wood debris such as branches and leaves. Habitats close to shore, especially on the north side of Cousins Inlet, have been modified by debris (bark, logs) from the log rafts stored in these areas. Substrates in the vicinity of Boscowitz Point are mainly sand or gravel.

The physical oceanography of Cousins Inlet was first described by Waldichuk (1962), whose observations were made when waste was being discharged from both the kraft and sulfite mills and the groundwood plant. Waldichuk's survey showed that the bottom waters in the upper end of Cousins Inlet (Ocean Falls Harbour) were characterized by severely depressed dissolved oxygen (D.O.) values (less than 0.1 mg L^{-1}), presumably due to the biological oxygen demand of the discharged wood wastes, both in the water column and on the bottom (Stein and Denison 1966). In July and December 1972, there had been considerable improvement in the D.O. levels in the harbour area, and values were generally greater than 2.0 mg L^{-1} (Table 3). The mill was almost completely shut down during this period. Another survey in August 1974, after the groundwood plant had started up again, yielded data which suggested that values were slightly depressed, but were still above the 1962 levels. Data obtained at this time were comparable

TABLE 1. *Station locations, depths, sediment types, and sampling techniques for the four surveys to Cousins Inlet.*

Station	Position	Depth (m)	Sediment type	1972-07-20	1972-12-03	1974-08-18	1975-11-19
0-3B	52°16.8' 127°46.0	125	gravel-clay	Van Veen;F[1](8 L)[2]	Petersen (5 L)	n.s.[3]	n.s.
0-4	52°17.2 127°45.8	90	silt-gravel	Van Veen;F (10)	Petersen;F (15)	Van Veen grab;F (7)	n.s.
0-4A	52°17.5 127°45.3	70	silt-gravel	Van Veen;F (10)	Petersen;F (3)	n.a.[4]	n.s.
0-5	52°18.9 127°45.2	73	mud	Van Veen;F (10)	Petersen;F (10)	Van Veen;F (10)	n.s.
0-6	52°19.9 127°44.5	74	wood debris-faecal pellets	Shipek;F (3.5)	Petersen;F (15)	Van Veen;F (10)	n.s.
0-7	52°20.7 127°43.9	67	faecal pellets	Shipek;F (3.5)	Petersen;F (15)	Van Veen;F[5](8)	Smith-McIntyre; F (10)
0-8	52°21.3 127°43.2	60	faecal pellets-wood debris	Shipek;F (3.5)	Petersen;F (3.5)	n.s.	n.s.
0-9	52°21.4 127°42.9	57	faecal pellets-wood fibres	Shipek;NF[1]	Shipek;F[6] (2)	Van Veen;NF	n.s.
0-10	52°21.4 127°42.4	45	wood fibres-oil clumps	Shipek;NF	Shipek;NF	Shipek;NF	n.s
0-11	52°21.4 127°41.7	27	wood, paper waste	Shipek;NF	Shipek;NF	Shipek;NF	n.s.
0-12	52°21.1 127°41.7	27	paper waste	Shipek;F[7] (3.5)	Shipek;F[7] (3.5)	Shipek;NF	Smith-McIntyre; F[7]
0-13	52°20.9 127°41.7	31	paper waste	Shipek;NF	Shipek;NF	Shipek;NF	n.s.
0-14	52°21.5 127°41.2	10	mud-wood debris	Shipek;NF	Shipek;NF	Shipek;NF	Smith-McIntyre;NF

Notes:

1. F indicates organisms were present; NF indicates no fauna in samples.
2. Sample volume (litres).
3. Not sampled.
4. Biological sample not available.
5. Biological sample not analysed.
6. Off-station, tree branches and rocky bottom close to shore sampled.
7. Not identifiable (less than 5 polychaetes).

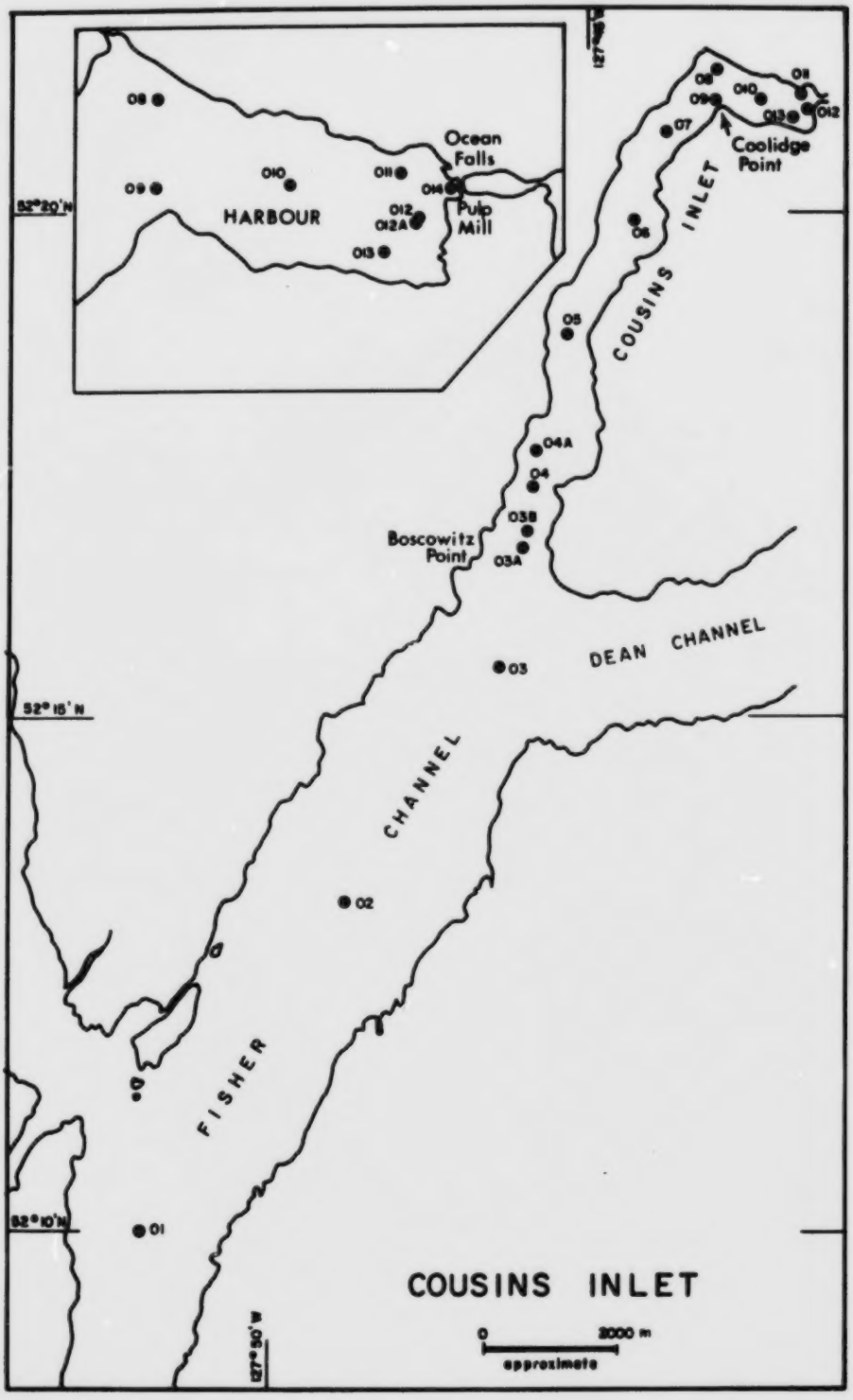

FIGURE 2: *Station locations in Cousins Inlet and Ocean Falls Harbour, 1972 to 1975.*

TABLE 2. *Station locations, depths and observations of sediment type made during the April 4, 1973 survey of Swanson Bay. All samples with Petersen grab (0.2 m^2).*

Station	Location	Depth (m)	Sediment type
A	53°0.4'N 128°31.2'W	217	Rock; 10-20 cm dia.
B	53°0.3' 128°31.1'	141	Rock mixed with gravel and shell
C	53°0.3' 128°30.9'	152	Gravel
D	53°0.6' 128°31.2'	115	Rocks; 10-20 cm dia.
E	53°0.5' 128°31.1'	76	Rock fragments; no sample
F	53°0.5' 128°30.9'	76	Rock
G	53°0.4' 128°30.8'	60	Rock cobble
H	53°0.7' 128°30.9'	59	Sand-barnacle shell
I	53°0.6' 128°30.8'	67	Gravel
J	53°0.6' 128°30.6'	52	Sawdust-sand
K	53°0.9' 128°30.8'	38	Woodchips-bark
L	53°0.8' 128°30.6'	25	Sand-barnacle shell-gravel
M	53°0.8' 128°30.5'	35	Woodchips-sand
N	53°0.7' 128°30.3'	22	Barnacle shell-gravel

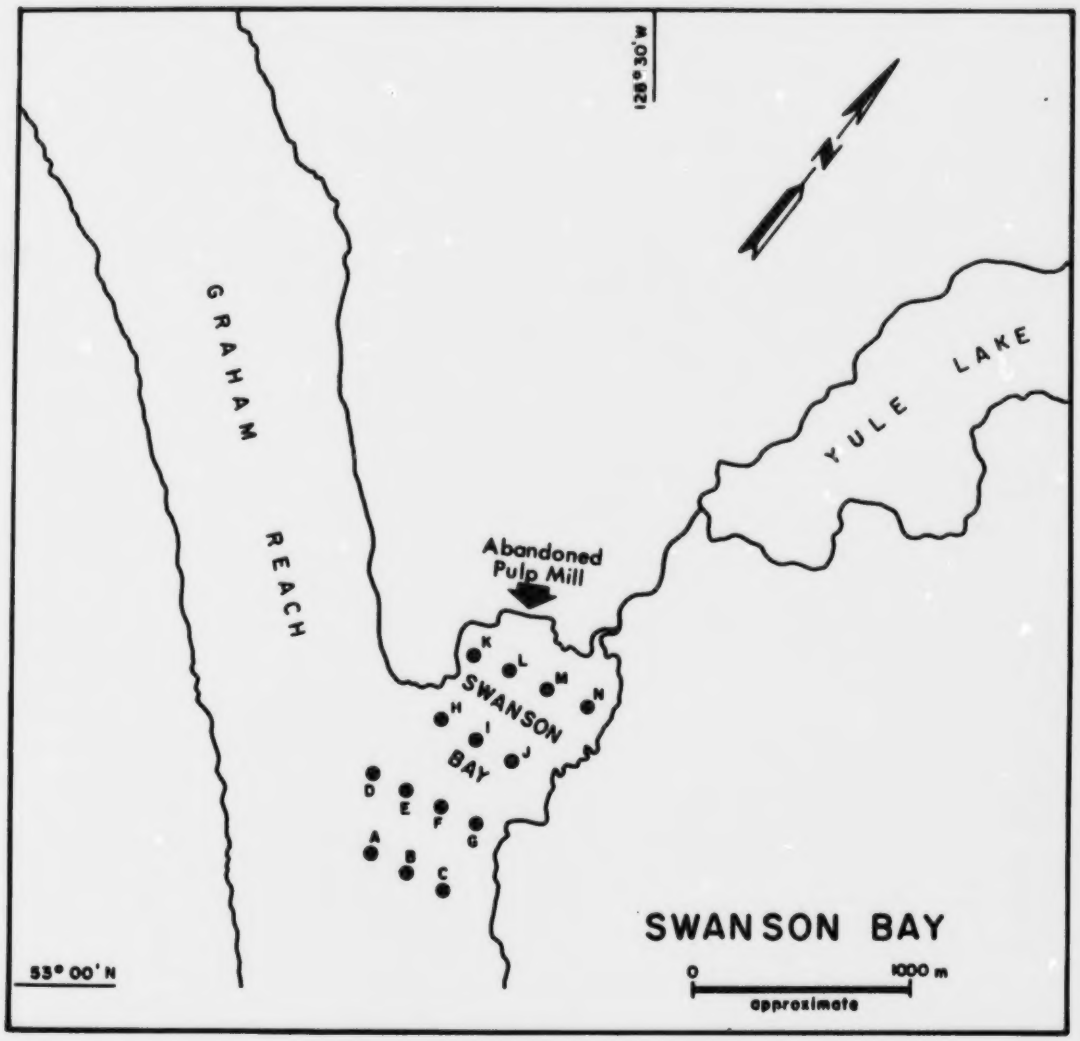

FIGURE 3: *Station locations in Swanson Bay, 1973 to 1975.*

to those reported by Packman et al (1975) for surveys conducted in June and September 1974. Our final brief survey in November 1975 suggested that considerable enhancement of D.O. values had occurred throughout Cousins Inlet. For example at station 0-12, a value of 4.32 mg L^{-1} was reported (Table 3).

TABLE 3: *Dissolved oxygen (D.O.) values in mg L^{-1}, 1 m off bottom at various stations in Cousins Inlet over the period 1972 to 1975. "ns" indicates "not sampled".*

Station	1972-07-1	1972-12-03-04	1974-08-01	1975-11-19
0-3	5.12	4.20	4.15	ns
0-3B	ns	6.02	ns	ns
0-4	5.21	2.48	4.90	ns
0-4A	ns	3.10	ns	ns
0-5	4.85	3.16	4.72	ns
0-6	4.28	3.27	4.41	ns
0-7	3.53	3.23	2.26	4.79
0-8	2.36	1.47	ns	ns
0-9	2.90	1.20	2.92	ns
0-10	2.07	3.33	1.98	ns
0-11	3.13	6.81	ns	ns
0-12	4.69	4.12	0.63	4.32
0-13	2.17	2.40	1.42	ns
0-14	4.33	8.60	ns	9.38

Bottom salinities in Cousins Inlet showed a trend typical for highly stratified B.C. estuaries. Salinity increased with depth and with distance from the head of the inlet, varying from about 30°/oo to 33°/oo (Table 4). Similar trends were observed by Waldichuk (1962) and Packman et al (1975). There seemed to be little evidence of seasonal changes in bottom salinity, even at the shallow stations, possibly because the freshwater inflow to the inlet is controlled by a hydroelectric dam.

Bottom temperature at Cousins Inlet varied seasonally, especially in the shallower waters in Ocean Falls Harbour. In general, deeper waters are cooler. In June 1974, Packman et al (1975) found minimum temperatures of 8° C in shallow depths less than 5 m, dropping to 6.5° C and lower below 20 m depth. By September 1974, warming was evident with temperatures of about 9.0° C in deeper waters and 11.0° C at shallower depths. These latter data are very similar to Waldichuk's (1962) values obtained in September 1961.

TABLE 4. *Distribution of bottom salinity (°/oo) (1 m off bottom) along the axis of Cousins Inlet, December 3, 4, 1972.*

Station	Depth (m)	Salinity (°/oo)
0-3	490	33.2
0-3B	110	32.4
0-4	75	32.1
0-4A	91	32.0
0-5	73	31.4
0-7	70	32.0
0-8	50	31.3
0-9	57	31.4
0-10	45	31.1
0-11	26	30.4
0-12	27	30.6
0-13	30	30.5
0-14	10	29.6

B. Swanson Bay

Swanson Bay is a small embayment (approximately 1 km wide and 1.5 km long) off the southern part of Graham Reach, an inlet parallel to the outer coast (Figure 3). The bathymetry of the bay has a steep profile, with depth decreasing from 200 m at the mouth, to 20 m at the site of the abandoned sawmill dock. Sediments within the bay reflect past industrial activity, as wood debris, primarily sawdusts, bark, chips, and sawn lumber fragments were mixed with sand and shell debris (Table 2, 8). Dr. Bruce Kellogg kindly examined sediment samples from stations J and M obtained in 1973. Sediment at station J was characterized by very fine particles of wood, bark fragments, and charcoal derived from spruce and Douglas fir. Wood in the sediments from Station M was all spruce, and much charcoal was present. The shell debris appeared to be composed primarily of crushed barnacle shells. Stations near the mouth of the bay and into Graham Reach were characterized by boulder, cobble, or gravel substrates and it was difficult to obtain adequate grab samples at these locations.

Oceanographic features of Swanson Bay and Graham Reach have not previously been documented and we have therefore provided the available data (Tables 5, 6). The waters are probably completely mixed because of strong tidal currents (up to 4 kts.) in Graham Reach, which cause eddies in the bay. Bottom temperatures ranged from 6.0 to 7.0°C on the two

TABLE 5. *Dissolved oxygen data (mg L^{-1}) and surface temperature (^{o}C) obained at Swanson Bay, April 1973. Deep samples were obtained 1 m off bottom using a Van Dorn bottle.*

Station	Depth (m)	Dissolved oxygen (mg L^{-1})	Temperature (^{o}C)
A	190	7.35	6.4
B	145	6.64	6.3
C	154	6.66	6.5
D	181	6.66	6.7
E	84	9.04	7.0
F	95	6.75	6.8
G	65	6.52	6.8
H	62	6.59	6.9
I	60	6.74	6.8
J	60	4.13	6.7
K	45	4.13	6.9
L	29	6.77	6.9
M	37	6.62	5.9
N	30	6.92	6.7

occasions (April 1973 and November 1975) that observations were made at Swanson Bay. In April 1973, D.O. levels near bottom ranged from 2.9 mg L^{-1} at stations J and K to 6.3 to 4.9 mg L^{-1} at the remainder of the stations. In November 1975, D.O. levels at stations J and M were approximately 5.8 mg L^{-1} (Table 6). Bottom salinity measurements in November 1975 showed values of 31.6^{o}/oo for station M (35 m) and 33.4^{o}/oo for station J (52 m), indicating some freshening from the large creek which drains into Swanson Bay from Yule Lake (Table 6).

TABLE 6. *Dissolved oxygen, salinity, and temperature data obtained 1 m off bottom at Swanson Bay (Stations J and M), November 1975. Because of very steep bathymetry, recorded depths are slightly different from 1973.*

Station	Depth (m)	Dissolved oxygen (mg L^{-1})	Temperature (^{o}C)	Salinity (^{o}/oo)
J	67	5.83	7.2	33.4
M	39	5.78	7.4	31.7

SAMPLING PROCEDURES

The CFAV LAYMORE (54 m) was used for sampling, and positions of the ship (Tables 1, 2) were obtained by radar bearings.

A. Biological Collection

(i) *Cousins Inlet.* Samples from Cousins Inlet used in the present report are from surveys in July 1972, December 1972, August 1974, and November 1975. The samples were obtained using a variety of grab types (Table 1). In the very soft and polluted sediments of Ocean Falls Harbour, it proved impossible to obtain samples with biological grabs, therefore a Shipek sampler, normally used by geologists, was employed. During 1972 and 1974, a Van Veen (0.1 m^2) or Petersen (0.2 m^2) grab was used at the outer stations in the inlet. A Smith-McIntyre (0.1 m^2) grab was available for the 1975 cruise. Replicate samples were not taken in most cases. Approximately 20 additional stations were made in the Harbour area and near Coolidge Point using a lifeboat from the LAYMORE in December 1972, April 1973, October 1973, August 1974, and November 1975. Depths at these stations ranged from 5 m at the head of the inlet to about 60 m near Coolidge Point. Radar from the LAYMORE was used to position the lifeboat. A 1 L Van Dorn bottle was used to obtain a water sample 1 m off bottom at each of the stations, and a small Petersen grab (1 L capacity) was lowered to sample sediments. This sampling was to determine if improvement in bottom habitats was occurring at areas missed by the regular, mid-channel station pattern. As mentioned above and shown in Table 7 there was evidence of appreciable enhancement of bottom D.O., especially in November 1975, but sediment composition appeared unchanged.

TABLE 7: *Results of dissolved oxygen (D.O.) surveys at stations from near Coolidge Point and in Ocean Falls Harbour from 1973, 1974 and 1975. Samples obtained from 1 m off bottom.*

	1973-04-2	1974-08-19	1975-11-19
Mean D.O. (mg L^{-1}); (std. dev.)	3.64(1.17)	2.42(2.41)	4.83(1.22)
Range D.O. (mg L^{-1})	1.71 to 7.70	0.00 to 12.07	3.71 to 9.29
Depth range (m)	11 to 66	5 to 58	4 to 60
Number of samples	22	23	21

ii) *Swanson Bay*. On April 4, 1973, 14 samples were obtained with a 0.2 m^2 Petersen grab on the grid shown in Figure 3. Although samples from this trip have not been completely examined to date, we have provided comments on bottom type for the convenience of future workers (Table 2). On November 18, 1975, replicate Smith-McIntyre grabs (0.1 m^2) were obtained at stations M (5 replicates) and J (3 replicates) and these samples are the focus of the present report. The latter samples were obtained with the ship at anchor, and with tidal rotation a number of sediment types were sampled (Table 8). For further statistical analyses these replicates should be treated as separate samples.

TABLE 8: *Sediment observations from the replicate samples obtained at Swanson Bay stations J and M on November 18, 1975. All samples obtained with 0.1 m^2 Smith - McIntyre grab and subsampled as indicated.*

Station, Replicate	Depth (m)	Sediment Type	Subsampled Level (Percent Retained)
J; R1	66	50% sand; 50% wood chips	50%
J; R2	66	wood debris (20cm boards) under 2-3 cm sand	50%
J; R3	67	80% sand, 20% wood debris	70%
M; R1	45	50% sand; 50% wood chips	50%
M; R2	45	80% sand; 20% pebbles	45%
M; R3	51	100% sand	70%
M; R4	47	100% sand	75%
M; R5	47	100% sand	80%

Samples from the grabs at both Cousins Inlet and Swanson Bay were sieved aboard ship using screens of 1.0 and 0.5 mm apertures, and the material retained by the sieves was placed in plastic bags and fixed in 10% formalin. On some occasions subsampling was necessary. Preliminary sorting, that is removal of organisms from sediments and debris, was conducted after staining with rose bengal. A stereomicroscope (12X) was used in the sorting.

B. Water Sampling and Analysis

Water samples were obtained 1 m off bottom using either a 1 L Van Dorn sampler or Nansen bottles. Dissolved oxygen was determined using the standard method outlined in Strickland and Parsons (1968). Salinity was determined using a Guideline Autosal Model 8400 salinometer. Surface temperatures were obtained using a standard mercury thermometer from bucket samples, and bottom temperatures with a reversing thermometer.

SYSTEMATICS SECTION

INTRODUCTION

A complete list of the species of polychaetes from this collection is to be found in Appendix C, with complete station listings for each locality in Appendices A and B. The following species have been deemed worthy of treatment in detail, being either new records, possible new species, or apparently rare to either British Columbia or to the localities under study. A few others that could be identified only to genus are also covered. The possible new species will be the subject of further study.

For the purposes of this report, we have concentrated our literature search on the northeastern Pacific, which we define as including the Bering Sea, east of 180° longitude, Alaska from the southern coast of the Seward Peninsula, south to northern California. Records from outside this area will not be as complete. That part of Alaska bordering the Chukchi Sea is considered Arctic, and has been counted as such in Appendix C.

POLYNOIDAE

Arcteobia anticostiensis (McIntosh, 1874). Swanson Bay, station M(5). The single specimen, consisting of an anterior fragment of about 17 setigers, is between 3 and 4 mm in length. It represents a new record for this genus and species for the northeastern Pacific.

The elytra are smooth except for a field of small papillae in the region of the anterior notch. The setae are much smoother than those of the following species. Aside from its small size, the specimen agrees very closely with syntypes of *Eupolynoe anticostiensis* McIntosh, 1874 collected by J.F. Whiteaves, Geological Survey of Canada, in 1872-1873, and presently deposited in National Museum of Natural Sciences, Ottawa.
Distribution: Arctic, Atlantic, northwestern Pacific. Sublittoral, 5-630 m.
Northeastern Pacific records: none, new record for this area.

Arcteobia spinielytris Annenkova, 1937 ex. Uschakov, MS. Swanson Bay, station M(1). One specimen consisting of an anterior fragment of 10 segments, without elytra, was found in this sample. The setae agree perfectly with those illustrated by Uschakov (1950) but the loss of the elytra renders the identification somewhat tentative. Additional specimens have recently been collected from south-east Alaska by an N.M.N.S. expedition, but the elytra on these

specimens, although similar in most respects to those illustrated by Uschakov, appear to possess longer and more abundant papillae. The anterior pair of eyes is located ventrally, giving the animal a superficial similarity to *Harmothoe imbricata* (Linnaeus, 1767), and with the capillary setae, to *Gattyana cirrosa* (Pallas, 1766).

Although this species is normally attributed to Ushakov (1950), it was first published by Annenkova (1934), as a nomen nudum citing Uschakov (sic) as the author. In 1937, the name, with Ushakov as its author, was again used by Annenkova without a description, but including a two-couplet key to separate it from *A. anticostiensis*. The full description and figures of this species were finally published by Ushakov in 1950. According to the rule of priority, we consider Annenkova (1937) the author, and adopt her original spelling.

Distribution: Northwestern Pacific; Japan to western Bering Sea. Sublittoral, 30-591 m.

Northeastern Pacific Records: None, new record for this area.

Gattyana ?treadwelli Pettibone, 1949. Swanson Bay, station M(5). Two specimens, fragmented and incomplete posteriorly, are tentatively referred to this species on the basis of the structure of the setae. These specimens were compared with one from the Berkeley Collection, collected from Goose Spit, Comox, British Columbia, and identified as *G. treadwelli* by Katherine Hobson. The upper, blunt notosetae are not quite as rugose as those of *G. cirrosa*, and the lower, capillary notosetae seem to have much longer teeth. The uppermost neurosetae are slender and spiny, with unidentate tips, followed by two or three more just above the acicula with bidentate tips. The subacicular neurosetae, however, seem to be the most important for the identification of this species. They are much longer and more slender than those of *G. cirrosa*, but are not quite as illustrated by Pettibone (1953), having a distinctly hooked tip. A more detailed study of this species is required. This species has not previously been recorded from British Columbia.

Distribution: Northeastern Pacific; Alaska to Washington. 20-30 m.

Northeastern Pacific records: Alaska (Pettibone 1949, Feder et al 1973), Washington (Pettibone 1949, 1953, Banse et al 1968).

Hesperonoe adventor (Skogsberg, 1928). Cousins Inlet, August 1974, station 0-4. A single small specimen in excellent condition. This appears to be the first time this species has been collected separately from a host echiuroid.

Distribution: Northeastern Pacific, Alaska to California; commensal with echiuroids *Echiurus echiurus alaskanus* and *Urechis caupo*. Intertidal to sublittoral.
Northeastern Pacific Records: Alaska (Fisher 1946 - identified by O. Hartman, commensal with *Echiurus echiurus alaskanus)*, California (Skogsberg 1928, Fisher and MacGinitie 1928a, b, Fisher 1946 - commensal with *Urechis caupo)*. A new record for British Columbia.

SIGALIONIDAE

Sigalion mathildae Audouin & Milne-Edwards, 1832. Swanson Bay, station J(2). A single large specimen, consisting of some 50 segments with the majority of the elytra intact, agrees perfectly with the description of this species by Uschakov (1955) and Fauvel (1923). A new record for North America.
Distribution: Atlantic, Mediterranean, Northwestern Pacific. Sublittoral, 0-120 m.
Northeastern Pacific Records: None, new to this area.

Sthenelais ?berkeleyi Pettibone, 1971. Swanson Bay, station M(1). A small post-larval specimen, 4 mm long, is tentatively assigned to this species on the basis of a strongly papillated ventral surface and the structure of the neuropodial setae. See Pettibone (1971) for synonymy.
Distribution: Northeastern Pacific; British Columbia to Washington. Intertidal to 110 m.
Northeastern Pacific Records: British Columbia (Berkeley and Berkeley 1962 as *S. articulata*, Pettibone 1971), Washington (Johnson 1901 as *S. fusca*, Pettibone 1953 as *S. fusca*, 1971), California (Berkeley and Berkeley 1941 as *S. tertiaglabra*, Pettibone 1971).

PHYLLODOCIDAE

Eteone californica Hartman, 1936. Swanson Bay, station M(1,4,5), station J(2,3). This species is much less common than its congener, *E. longa* (Fabricius, 1780). It was identified primarily by the size and shape of the dorsal and ventral cirri, the latter being much shorter than the setigerous lobe. One to four specimens found per sample.
Distribution: Northeastern Pacific; Alaska to California. Intertidal to 50 m.
Northeastern Pacific Records: Alaska (Hartman 1948b), California (Hartman 1968). A new

record for British Columbia.

Phyllodoce mucosa Oersted, 1843. Swanson Bay, station M(4,5) station J(3). One to five specimens found per sample. This is only the second record of this species from British Columbia.

Distribution: Arctic, North Atlantic, Mediterranean, Southeast Atlantic, North Pacific. Intertidal to 425 m.

Northeastern Pacific Records: Alaska (Hartman 1948b), British Columbia (Berkeley and Berkeley 1948), California (Hartman 1968).

LACYDONIIDAE

Swanson Bay, Station M(4). Two small specimens that appear to belong to this family were found. We have not yet been able to assign them to a genus. They will be the subject of a more detailed study at a later date. This family has not previously been recorded from the northeastern Pacific although *Paralacydonia paradoxa* Fauvel, 1913 is known from southern California (Hartman 1968).

HESIONIDAE

Gyptis brevipalpa (Hartmann-Schroeder, 1959). Cousins Inlet, December 1972, stations O-4, O-5, O-7; August 1974, station O-5. A single specimen found in each sample.

Distribution: Eastern Pacific; El Salvador to Washington. Subtidal to 200 m.

Northeastern Pacific Records: Washington (Banse and Hobson 1968, Banse et al 1968, Armstrong et al 1976), California (Hartman 1968 as *Gyptis arenicola glabra)*. A new record for British Columbia.

Kefersteinia cirrata (Keferstein, 1862). Swanson Bay, station M(2,3). Two specimens found in each sample.

Distribution: North Atlantic, Mediterranean, Northeastern Pacific; British Columbia. Littoral to 250 m.

Northeastern Pacific Records: British Columbia (E. Berkeley 1923 as *Castalia fusca,* Berkeley and Berkeley 1942, 1948).

PILARGIIDAE

Sigambra tentaculata (Treadwell, 1941). Cousins Inlet, July 1972, stations 0-5, 0-7; December 1972, stations 0-6, 0-9; August 1974, stations 0-5, 0-6, 0-7. Although the 1972 samples had only one or two specimens each, the 1974 samples had as many as five. This species was numerically dominant in samples from 1974 station 0-6 and 0-7. In one sample from 0-7, it was the only species found. (See Pettibone (1966) for synonymy.)
Distribution: Widely scattered records from the Western Atlantic and Eastern Pacific. Intertidal to 5000 m.
Northeastern Pacific Records: Washington (Banse and Hobson 1968, Banse et al 1968, Armstrong et al 1976), California (Hartman 1968). A new record for British Columbia.

SYLLIDAE

Autolytus sp. Swanson Bay, station J(3). A single specimen of the sexual form was found. Studies to assign the sexual forms to their asexual counterparts is still incomplete (Gidholm 1965, 1966).

Exogone molesta Banse, 1972. Cousins Inlet, November 1975, station 0-4; Swanson Bay, station M(5). A single specimen was taken from each locality.
Distribution: Washington (type locality). 27-40 m.
Northeastern Pacific Records: Washington (Banse 1972b). A new record for British Columbia.

Exogone sp. Cousins Inlet, July 1972, station 0-3B; December 1972, stations 0-3B, 0-4, 0-4A; November 1975, station 0-4. Swanson Bay, station M(1). Most of these samples contained single specimens but the last sample from 0-4 and the Swanson Bay sample contained 3 and 2 respectively. Species identification was not attempted due to the condition of the specimens.

Pionsyllis uraga Imajima, 1966. Swanson Bay, station M(1-5), J(1-3). This species was found in all samples from Swanson Bay, 2-6 specimens per sample.
Distribution: Western Atlantic, North Pacific. 20-150 m.
Northeastern Pacific Records: Washington (Banse et al 1968, Banse and Hobson 1968). A new record for British Columbia.

Sphaerosyllis brandthoreti Hartmann-Schroeder, 1965. Swanson Bay, station M(4). A single specimen was found.

Distribution: Eastern Pacific; Chile, Washington. Sublittoral to 264 m.

Northeastern Pacific Records: Washington (Banse 1972b). A new record for British Columbia.

NEREIDAE

Nereis (Eunereis) wailesi Berkeley and Berkeley, 1954. Cousins Inlet, August 1974, station 0-4A. The single specimen consists of two fragments with a total of 45 segments, 10 mm total length. The paragnaths and parapodia agree completely with Berkeley and Berkeley's (1954) description. The setal lobes still retain pigment after six years in formalin. This appears to be only the second specimen of this species to be found.

Distribution: British Columbia. 90 m.

Northeastern Pacific Records: British Columbia (Berkeley and Berkeley 1954)

NEPHTYIDAE

Nephtys cornuta franciscana Clark and Jones, 1955. Cousins Inlet, July 1972, stations 0-3B, 0-4A, 0-5, 0-6, 0-7; December 1972, stations 0-3B, 0-4A, 0-5, 0-7, 0-8, 0-9.

Nephtys cornuta cornuta Berkeley and Berkeley, 1945. Cousins Inlet, August 1974, stations 0-4, 05, 0-6. The subspecies *N.c. franciscana* was common in the 1972 samples from Ocean Falls, from 1 to 5 specimens being found in each sample. In 1974, only the eyeless nominate subspecies was found.

The subspecies is separated from *N. c. cornuta* by the presence of eyes, the presence of fenestrated setae in all segments rather than just the anterior ones, and a much smaller size, ranging from 2 to 6.5 mm instead of a maximum of 10 to 15 mm (Clark and Jones 1955). In our specimens of *N. c. cornuta,* the largest was incomplete at 7 mm and 23 segments, with the fenestrated setae disappearing between segments 1o and 20. Pigmentless eye-structures could be found under the cuticle of segment three when the specimens were cleared in glycerin. We do not agree with Hartman (1968) that the only reliable characteristic for the separation of *N. c. franciscana* is the smaller size of the subspecies, as polychaetes normally grow from small worms to larger ones, and the "mature" size may be influenced by environmental conditions and/or the genetic variation of the local population. The small size of *N. cornuta* and the rudimentary nature of the parapodial lamellae and branchiae

suggest that it might be considered for inclusion in the genus *Micronephthys*. A comprehensive study of the smaller species of *Nephtys* would be very useful.

Distribution: Northeastern Pacific; Alaska to California. Subtidal to 50 m.

Northeastern Pacific Records: *N. cornuta:* Alaska (Feder et al 1973), British Columbia (Berkeley and Berkeley 1945, 1948), Washington (Berkeley and Berkeley 1942, 1948, Banse et al 1968). *N.c. franciscana:* British Columbia (Levings and Coustalin 1975), Washington (Banse 1972) California (Clark and Jones 1955, Hartman 1968).

SPHAERODORIDAE

Sphaerodoropsis sp. Cousins Inlet, December 1972, station O-3B; August 1974, station O-4. Two specimens that appear to belong to this genus could not be referred to any known species. They will form the basis of further study.

GLYCERIDAE

Glycera sp. Cousins Inlet, July 1972, station O-5; December 1972, station O-6; August 1974, station O-6; Swanson Bay, station M(3). Single specimens were found in each sample, but were too damaged to assign to any species in this genus.

GONIADIDAE

Goniada maculata Oersted, 1843. Swanson Bay, station M(1,3,4) and J(3). Six specimens, mostly anterior fragments, were identified as this species.

Distribution: Arctic Canada, North Pacific; Alaska to lower California. Low water to 2300 m.

Northeastern Pacific Records: Alaska (Berkeley and Berkeley 1942, Feder et al 1973), Washington (Banse et al 1968). Not previously recorded from British Columbia.

EUNICIDAE

Eunice kobiensis McIntosh, 1885. Swanson Bay, station M(2), J(3). A single specimen was found at each station. The specimen from station M was in especially fine condition. It is complete, with about 110 segments contracted to just under 50 mm, and was found in its tube which consisted of a parchment-like fabric covered with pieces of gravel, shell, and wood.

The median antenna is nearly smooth, showing only three indistinct annulations and is not significantly longer than the lateral antennae on either side of it, reaching to the anterior margin of the fifth thoracic segment. None of the branchiae has more than eight filaments. The pectinate setae from segment 55 have 14 to 16 small teeth and one long one.

Gustus (1972) examined 117 specimens of *Eunice* collected from Alaska, British Columbia and Washington, to determine the extent of variation of the different characteristics that have been used by authors to separate the six species of the *flavus-bidentatus* group which have been reported from the northeastern Pacific, (*E. biannulata* Moore, 1904; *E. kobiensis* McIntosh, 1885; *E. segregtata* Chamberlin, 1919; *E. semisegregata* Fauchald, 1970; *E. valens* Chamberlin, 1919); and *E. websteri* (Webster, 1884). She concluded that the only reliable characters were the form of the parapodial lobes in the branchial region, the number of teeth on the comb setae, the form of the subacicular hooks and compound falcigers, and the structure of the first branchia. She considered *E. valens* a synonym of *E. kobiensis*.

Banse and Hobson (1974) argued that *E. valens* is a valid species distinguished by its short median antenna. Gustus (1972) suggested that the apparent length, as measured by the number of segments covered, is an artifact of improper relaxation prior to preservation of the specimen. Banse and Hobson appear to be the only researchers to have identified *E. valens* from British Columbia and Washington, as indicated in the checklist in their key (1974) but their records have not yet been published. They do not include *E. kobiensis* in the key.

The specimens from Swanson Bay have been assigned to *E. kobiensis* on the basis of the relatively long median antenna and a maximum of eight filaments in the branchiae. The hoods of the subacicular hooks and compound falcigers show much stronger "sculpturing" below the lower fang than is illustrated by Gustus (1972) or Fauchald (1969), but this may be a variable character and/or an artifact of the preservation procedure.

Distribution: North Pacific; Alaska to Washington. Intertidal to 350 m.

Northeastern Pacific Records; Alaska (Moore 1908, Berkeley and Berkeley 1942, 1948, Gustus 1972), British Columbia (Berkeley and Berkeley 1942, 1948, Gustus 1972), Washington, (Gustus 1972).

LUMBRINERIDAE

Lumbrineris ?californiensis Hartman, 1944. Swanson Bay, station M(1). Four small speci-

mens, none complete, were assigned tentatively to this species on the basis of their black aciculae and elongate posterior parapodial lobes. A certain amount of confusion was encountered regarding this species, as Hartman's original description (1944a, page 163), and subsequent redescription (1968, page 749) describe the aciculae as being yellow, although it is keyed out on the basis of their being black (1944a, page 145; 1968, page 740). We have been assured (K. Fauchald, pers. comm.) that the aciculae are indeed black in the type specimens, but we still consider this to be a tentative record due to the small size and incompleteness of the specimens.

Distribution: Northeastern Pacific; Puget Sound to western Mexico. 10-400 m.

Northeastern Pacific Records: Washington (Banse and Hobson 1968, Banse et al 1968), California (Hartman 1944a, 1968). A tentative new record for British Columbia.

Lumbrineris pallida Hartman, 1944. Swanson Bay, station M(4,5), station J(2). A total of ten small specimens of this species was found. The large plate attached to maxilla IV is distinct, the setae are very pale but the aciculae are black. Hobson (1971) states that she did not find the large plate on maxilla IV of her specimens.

Distribution: Northeastern Pacific; Washington to Mexico. Subtidal to at least 140 m.

Northeastern Pacific Records: Washington (Hobson 1971), California (Hartman 1944a, 1968). New record for British Columbia.

ARABELLIDAE

Drilonereis longa Webster, 1879. Swanson Bay, station M(2). A single specimen, complete in two parts, was found. The jaw apparatus agrees well with that described for *D. longa*, with four teeth on the basis of the large falcate maxilla I, six large teeth on maxilla II, and maxillae III - IV unidentate. The rear portion of the animal appears to be regenerating and shows only elongate postsetal lobes.

Distribution: Western Atlantic; Northeastern Pacific; Washington to California. Intertidal to 2475 m.

Northeastern Pacific Records: Washington (Hobson 1971), California (Hartman 1968). A new record for British Columbia.

DORVILLEIDAE

Schistomeringos annulata (Moore, 1906). Cousins Inlet, July 1972, station 0-5; December 1972, station 0-5, 0-7; August 1974, station 0-6. A total of seven specimens has been assigned to this species on the basis of the very long, fine blades on some of the compound setae, and the presence of only two rows of maxillaries. As noted by E. Berkeley (1927) the blades are not quite as long as those depicted for Moore's type specimens from Washington, but they are significantly longer and finer than those of *S. longicornis*. The genus *Schistomeringos* was erected by Jumars (1974) to include all those species of *Dorvillea* processing furcate setae.

Distribution: Northeastern Pacific; British Columbia to Baja California. 45 to 264 m.

Northeastern Pacific Records: British Columbia (E. Berkeley 1927, Berkeley and 1948), Washington (Moore 1906, 1908).

Schistomeringos longicornis (Ehlers, 1901). Swanson Bay, station M(1-5), J(1-2). A total of 20 specimens of this species was found in the Swanson Bay samples. This species in this area was previously reported as *Dorvillea rudolphi*. Earlier authors considered it identical to that nominal species described by Delle Chiaje in 1828 from the Bay of Naples. Jumars (1974) assigned all northeastern Pacific records of *"D. rudolphi"* to the species originally described by Ehlers (1901) as *Stauronereis longicornis*. A careful examination of the specimens from Swanson Bay indicated that they agreed well with Jumars' criteria viz: furcate setae from setiger 2, and a mean short tine/long tine ratio of 0.34 (sd=0.01) for the furcate setae on setiger 10 (n=6).

Distribution: Eastern Pacific; British Columbia to Baja California; Chile. Low tide to 575 m.

Northeastern Pacific Records (see Jumars (1974) for synonymy): British Columbia (E. Berkeley 1927, Berkeley and Berkeley 1945, 1948, Ellis 1967, 1968a), Washington (Banse et al 1968, Woodin 1974), Oregon (Hartman and Reish 1950), California (Hartman 1968).

ORBINIIDAE

Scoloplos (Leitoscoloplos) pugettensis Pettibone, 1957. Cousins Inlet, July 1972, station 0-5; December 1972, 0-3B, 0-5, 0-6; August 1974, 0-5, 0-6; Swanson Bay, station M(2). A total of eight specimens have been identified as this species, those from 0-3B and M(2) only

tentatively due to their small size.

This species was originally described as *Scoloplos elongata* by Johnson (1901). Since this name is a junior primary homonym of *Scoloplos elongatus* Quatrefages, 1865, Pettibone (1957) correctly renamed it *S. pugettensis*.

The proper genus for this species is a much thornier problem. There are two groups of species included in the genus *Scoloplos*, one of which (*Scoloplos* sensu stricto) develops blunt thoricac hooks with age (Curtis, 1969), and another group that apparently does not. *S. pugettensis* belongs to this second group, which was given the name *Haploscoloplos* by Munro (1933). Unfortunately, Monro chose as his typespecies the Australian *S. cylindrifer* Ehlers, 1904, which has recently been shown by Day (1977) to possess small, inconspicuous thoracic hooks. Day consequently erected the genus *Leitoscoloplos* for those species of *Scoloplos* that have not yet been shown to develop thoracic hooks.

Pettibone (1957) notes that the hooks are sometimes difficult to observe and are easy to overlook, as they may occur in some thoracic neuropodia and be missing in others. Her suggestion that they may be due to abrasion of the crenulate capillaries by the substratum has been generally refuted (Berkeley and Berkeley 1958; Curtis 1972), but it does appear that they may develop as the worm increases in size. For *Scoloplos armiger*, they are normally present from a maximum width of 0.8 mm (Curtis 1969), but no such studies have been done on the northeastern Pacific species *Scoloplos* (*S.*) *acmeceps* Chamberlin, 1919 which is often found in the same samples as *S.(L.) pugettensis*. This situation means that small specimens are essentially indeterminable, possibly belonging to either of these two genera. We therefore prefer to retain *Leitoscoloplos* as a subgenus.

Distribution: Arctic, Northeastern Pacific; Alaska to Baja California. Intertidal to 500 m.

Northeastern Pacific Records: Alaska (Hartman 1948b, Berkeley and Berkeley 1956), British Columbia (E. Berkeley 1927, Berkeley and Berkeley 1942, 1952, Ellis 1967, 1968a, 1968b, 1969, Packman 1977), Washington (Johnson 1901, Treadwell 1914, Pettibone 1957, Hartman 1957, Miller, 1967; Banse et al, 1968; Lie and Kisker, 1970; Armstrong et al, 1976) Oregon (Hartman and Reish 1950), California (Hartman 1969).

PARAONIDAE

This family has recently been the subject of a number of revisions, most notably Laubier (1967), Laubier and Ramos (1973), Strelzov (1973), Imajima (1973) and Hobson (1971, 1972).

Strelzov's monograph is extremely comprehensive; and Hobson's papers focus on the Paraonidae of British Columbia and Washington.

Most of these species are small worms, 5 to 10 mm in length, whose identity is determined by the form of the prostomial palp, the number and arrangement of gills, and the structure of the modified setae of the posterior setigers. These setae require the use of scanning electron microscopy for proper resolution, and this has not yet been done for the north-eastern Pacific species.

The Paraonidae of the area under study appear to be reasonably well-defined when one looks only at this area. However, their relationship to similar species on a world-wide basis is still a problem. This is particularly true for *Aricidea neosuecica* Hartman, 1965. Until a more complete study of these species has been carried out, one must consider all records for the family as tentative. (K. Fauchald, pers. comm.).

Aricidea neosuecica Hartman, 1965 *sensu* Hobson, 1972. Cousins Inlet, July 1972, station 0-3B, 0-4, 0-4A; December 1972, 0-3B, 0-4, 0-4A, 0-6; August 1974, 0-4, 0-5; Swanson Bay, M(1,2,4,5), J(2,3). This species was very common in the Ocean Falls samples, and dominant in the August 1974 samples from 0-4, with 67 specimens in 3 lots. It is the most common species of Paraonidae in this collection.

Strelzov (1973) does not accept *Aricidea neosuecica* as a valid species because of Hartman's (1965) incomplete description and the fact that the type specimens he examined did not agree with Hartman's diagnosis. He states that *A. neosuecica* is very similar to *A. simplex* (Day 1963) in the structure of the prostomial palp and specialized setae, and differs only in the number of branchiae and the point of attachment of the prostomial palp. According to Hartman however, *A. neosuecica* has 8-11 pairs of gills, the same number that Day (1967) lists for *A. suecica simplex*. Strelzov has raised this subspecies to species (and put it in a different sub-genus), and suggested that the maximum number of gills may be 24. It also appears that *A. simplex* has completely smooth specialized setae. Hobson (1972) found a minute pubescence present on the convex portion of the "shoulder" of these setae. She also found that mature specimens from British Columbia have 12-16 pairs of branchiae. The specimens found in the present collection agree exactly with Hobson's description but there now appears to be a question as to their identity. The British Columbia specimens are apparently intermediate in gill number between Day's *A. simplex*, Hartman's *A. neosuecica*, and Stelzov's *A. simplex*. It is obvious that this species complex requires more study, and we

follow Hobson (1972) herein until that work has been carried out.

Distribution: British Columbia, Southern California, off New England. 16-4749 m.

Northeastern Pacific Records: British Columbia (Berkeley and Berkeley 1950, 1952 as *A. jeffreysii;* Hobson 1972), California (Hartman 1969).

Aricidea ramosa Annenkova, 1934. Ocean Falls, July 1972, stations 0-3B, 0-4A; December 1972, 0-5; August 1974, 0-4, 0-5, 0-6. This species was most abundant at station 0-4, where nine of the 12 specimens present in the collections were found.

Distribution: North Pacific. 44-2400 m.

Northeastern Pacific Records: British Columbia (Packman 1977), Washington (Banse et al 1968, Banse and Hobson 1968), California (Hartman 1969).

Paraonis gracilis (Tauber, 1879). Cousins Inlet, July 1972, stations 0-3B, 0-4A, 0-5; December 1972, 0-3B, 0-4, 0-6; August 1974, 0-4, 0-5, 0-6; Swanson Bay, J(2,3). This was the second most common paranoid in the collection, with a total of 42 specimens, 28 of which were found in samples from stations 0-4 and 0-4A. See Strelzov and Uschakov (1975) and ICZN(1981) for discussion and ruling on the generic name for this species.

Distribution: Arctic, Atlantic, Antarctic, Pacific; Kuril Islands to Chile. 10-3860 m.

Northeastern Pacific Records: Alaska (Reish 1965, Feder et al 1973), British Columbia (Packman 1977), Washington (Banse and Hobson 1968 as *Paraonis ivanovi),* California (Hartman 1969).

SPIONIDAE

?Microspio sp. Cousins Inlet, August 1974, station 0-4. Four small specimens, less than 0.5 mm in width, 3 mm long for 27 segments, were found that do not seem to correspond to any known species of Spionidae from this area. These specimens lacked branchiae, except for a single cirriform branchium on the tenth setiger of the largest specimen, but branchial scars were found at the bases of the notopodial dorsal lamellae from setiger 2 to about setiger 12. The prostomium is elongate and rectangular, with no eyes apparent. Setiger one is reduced. Neuropodial hooded hooks appear about setiger 12, and have three small teeth in tandem with the main fang at right angles to the stem; the hood is long and completely covers the teeth.

The specimens are superficially similar to *Microspio pigmentata* (Reish, 1959b) from California, except for the lack of eyes, lack of characteristic pigmentation, and the struc-

ture of the neuropodial hooks, which are most similar to those of *Prionospio steenstrupi* Malmgren 1867. However, there is no evidence of dorsal folds or crests, and *P. steenstrupi* does not have branchiae extending to setiger 12. It is unfortunate that the specimens were damaged during collecting, precluding species identification.

Polydora caulleryi Mesnil, 1897. Swanson Bay, station J(2,3). Two specimens were found of this species, one in each sample from station J. Both specimens are in good condition, though incomplete, and exhibit the typical brush-tipped specialized setae on setiger 5 that separate this species from all other *Polydora* except *P. brachycephala* Hartman from California. Pettibone (1954) and Blake (1971) synonymized these two species but they have recently been re-separated (Light, 1977) on the basis of larval pigmentation and the longer caruncle on *P. brachycephala* (to setiger 6 or 7). The present specimens have the short caruncle, that of the specimen from J2 extending to setiger 4, and of the other, to 3.

A fragment from Ocean Falls station 0-4A also possesses the characteristic setae but the head is missing. It could be either *P. caulleryi* or *P. brachycephala*.

Distribution: Arctic, North Atlantic, northeastern Pacific; British Columbia to Washington. Intertidal to 200 m.

Northeastern Pacific Records: British Columbia (Bernard 1978), Washington (Pettibone 1954 (in part), Armstrong et al 1976).

Spio butleri Berkeley and Berkeley, 1954. Swanson Bay, station J(3). The single specimen taken from a depth of 66 m appears to be only the second record of this species since it was originally described by Berkeley and Berkeley. Since their specimens were collected from tide pools, this is also a new depth record. The specimen is an anterior fragment of 22 segments, 8 mm long and 1.5 mm wide. The diagnostic hooded neuropodial hooks start at segment 20. The prostomium and the wide flaring bases for the tentacular cirri are darkly pigmented, even after four years in preservative. There are also pigment spots on the first five segments and the branchiae.

Distribution: British Columbia. Intertidal to 66 m. New depth record.

Northeastern Pacific Records; British Columbia (Berkeley and Berkeley 1954).

Spiophanes bombyx (Claparède, 1870). Swanson Bay station M(1-5), J(1-3). Although considered rare in the northeastern Pacific, this species made up almost 40% of the polychaetes in

the Swanson Bay samples. By number, it could be considered the dominant species for this one locality.

Distribution: Arctic, North Atlantic, Mediterranean, South Atlantic; Antarctic, South Pacific, North Pacific; Alaska to California. Intertidal to 119 m.

Northeastern Pacific Records: Alaska (Reish 1965), British Columbia (E. Berkeley 1927, Berkeley and Berkeley 1952), Washington (Armstrong et al 1976), California (Hartman 1969, Light 1978).

Streblospio benedicti Webster, 1879. Cousins Inlet, July 1972, stations 0-4A, 0-6; Swanson Bay, M(5). Four small specimens, none mature, appear to be the first record of this species from British Columbia. The identification was confirmed by Dr. Rita O'Clair. Foster (1971) lists Washington as a locale for this species but does not document her record.

Distribution: North Atlantic, Mediterranean, Caribbean Sea, northeastern Pacific; British Columbia to California. Estuarine, intertidal to subtidal.

Northeastern Pacific Records: Washington (Foster 1971, Hobson 1976), California (Hartman 1969, Light 1978).

MAGELONIDAE

Magelona berkeleyi Jones, 1971. Swanson Bay, station M(2), J(1). Three specimens of this species were found. The tridentate hooded hooks make it easy to separate this species from *M. longicornis* Johnson, 1901. It is distinguished from *M. japonica* Okuda, 1937 by the presence of a ventral medial lobe in the anterior segments (Jones 1963, 1971).

Distribution: Washington, Puget Sound, 32-66 m.

Northeastern Pacific Records: Washington (Jones, 1971). New record for British Columbia. New depth record.

CIRRATULIDAE

The following identifications are based on the current literature and direct comparison with specimens identified by Katherine Hobson in the British Columbia Provincial Museum. However, many of the species involved are poorly defined, and detailed information on certain important characteristics such as setal structure, tubes, and life history is lacking. We agree with Fauchald (1977) that the family is badly in need of revision, and suspect that a

thorough review will result in a drastic reduction in the number of species in certain genera. All of the following identifications must be considered tentative, especially those referred to the genus *Tharyx*.

Chaetozone acuta Banse and Hobson, 1968. Swanson Bay, station M(1,4,5). Three specimens of this species agree well with the diagnosis.
Distribution: Washington, Puget Sound. 20-40 m.
Northeastern Pacific Records: Washington (Banse and Hobson 1968). A new record for British Columbia.

Cirratulus cirratus spectabilis (Kinberg, 1866). Ocean Falls, December 1972, station O-9; Swanson Bay, M(4). A single specimen in excellent condition was found at each station. This species, which is more common in the intertidal zone, was taken near its recorded maximum depth. It was originally described as *Promenia spectabilis* by Kinberg (1866), based on specimens from Vancouver Island. Johnson (1901) subsequently described two species, *Cirratulus robustus* and *C. cingulatus* from Puget Sound. Treadwell (1922) considered these two species conspecific but Hartman (1938) concluded that *C. robustus* was valid and *C. cingulatus* was conspecific with *C. cirratus* (O.F. Müller, 1776). Berkeley and Berkeley (1950) recorded *C. cirratus*, sensu stricto, for the first time from British Columbia and synonymized both *C. cingulatus* and *C. robustus* with *C. spectabilis*, based on the variation in the features used to characterize these species. Pettibone (1954) synonymized *C. spectabilis* with *C. cirratus*. Hartman (1961) reduced *spectabilis* and *cingulatus* to subspecies of *C. cirratus* based primarily on the first occurrence of notopodial hooks. The following list includes all *C. robustus* records but omits most of those pertaining to *C. cirratus*.
Distribution: Northeastern Pacific; Alaska to California. Intertidal to lower littoral zone.
Northeastern Pacific Records: Alaska (Treadwell 1914), British Columbia (E. Berkeley 1929, Berkeley and Berkeley 1942, 1952, Hartman 1948a, Packman 1977), Washington (Kinberg 1866; Johnson 1901, Treadwell 1922, Pettibone 1943), Oregon (Hartman and Reish 1950), California (Hartman 1969).

Tharyx ?monilaris Hartman, 1960. Swanson Bay, station M(3,5). Two small specimens have been tentatively assigned to this species on the basis of setae, insertion of branchiae and palps,

and small size. However, all specimens are broken and lack the inflated posterior section.
Distribution: Northeastern Pacific; Alaska, California. Sublittoral shelf and basin depths.
Northeastern Pacific Records: Alaska (Feder et al, 1973), California (Hartman 1960, 1969).
A possible new record for British Columbia.

Tharyx securdus Banse and Hobson, 1968. Swanson Bay, station M(1,2). Three small specimens of this species, all in fragments, were collected. One specimen from sample M(2) was found inside a thin mucoid tube.
Distribution: Washington. Subtidal to 20 m.
Northeastern Pacific Records: Washington (Banse et al 1968, Banse and Hobson 1968). A new record for British Columbia.

Tharyx serratisetis Banse and Hobson, 1968. Swanson Bay, Station M(5). One specimen, an anterior fragment of 37 segments, is tentatively referred to this species. It is distinguished from the preceding species by the shorter, non-beadlike, median segments, and the stronger serration of the setae. The latter are similar to those of smaller specimens of *T. tesselata,* Hartman, 1960. The prostomium is much longer and more acute than that of the Ocean Falls specimens, and there is no evidence of a mucoid tube. The gills are very sparse and short, possibly due to the lack of a protective tube structure. However, it is possible that further study will show this species inseparable from *T. tesselata.*
Distribution: Washington. Sublittoral.
Northeastern Pacific Records: Washington (Banse and Hobson 1968). A new record for British Columbia.

Tharyx tessalata Hartman, 1960. Ocean Falls, December 1972, station O-4; August 1974, O-4. A total of 25 specimens of this species was found in these two samples. Several of the largest specimens are very close to those described by Hartman (1960), including the remarkable tesselated tube structure, serrated setae on the posterior segments, palp insertion, and the very long gills on each segment. Some smaller specimens have just the beginning of the tube structure visible, shorter gills, and much stronger serration of the median and posterior neurosetae, approaching, but not identical to those shown for *T. serratisetis* by Banse and Hobson (1968).
Distribution: Southern California. Shallow subtidal to "great depths".

Northeastern Pacific Records: California (Hartman 1960, 1968). New record for British Columbia.

COSSURIDAE

Cossura longocirrata Webster and Benedict, 1887. Cousins Inlet, December 1972, station 0-4. A single anterior fragment appears to be referrable to this species. The tentacle is inserted on the posterior margin of the second setiger. The setae are smooth capillaries.

Banse (1981) has re-identified the specimens attributed to this species by Berkeley and Berkeley (1956), as well as other Washington records, as *C. soyeri* Laubier, 1967. The following records are therefore cited as a matter of record only. Since it appears that there are at least three species of this genus present in the northeastern Pacific, all previous records must be considered tentative.

Distribution: Arctic, North Atlantic, North Pacific; Alaska to Washington. Intertidal to 887 m.

Northeastern Pacific Records: Alaska (Reish 1965, Feder et al 1973), Washington (Berkeley and Berkeley 1956, Banse 1963, Miller 1967). A new record for British Columbia.

Cossura modica Fauchald and Hancock, 1981. Cousins Inlet, December 1972, stations 0-5, 0-6; August 1974, 0-5. A total of 15 anterior fragments that appear to belong to this recently described species were found in the collection. All specimens have two complete achaetous segments anteriorly. The tentacle is inserted on the fourth setiger, separating this species from all other northeastern Pacific *Cossura*. The setae are strongly serrated limbate capillaries. The largest specimen, from station 0-5, is 0.5 mm wide, about 4 mm long for 40 segments, and is full of eggs. The other specimens are immature, 0.3 to 0.35 mm in width.

Distribution: Central Oregon. 75-2400 m.

Northeastern Pacific Records: Central Oregon (Fauchald and Hancock, 1981). A new record for British Columbia, new depth record.

SCALIBREGMIDAE

Asclerocheilus beringianus Ushakov, 1955. Cousins Inlet, December 1972, stations 0-9, 0-4. The three specimens collected from Ocean Falls represent only the third record of this species from the northeastern Pacific and a northerly extension from southern British Colum-

bia. E. Berkeley (1930) listed "*Asclerocheilus* sp.?" from Nanaimo but gave insufficient information to determine if this is the species involved.

Distribution: Northwestern Atlantic, Bering Sea, northeastern Pacific; British Columbia to Washington. 57-5018 m.

Northeastern Pacific Records: British Columbia (?E. Berkeley, 1930, Hobson 1974), Washington (Hobson 1974).

OPHELIIDAE

Travisia japonica Fujiwara, 1933. Swanson Bay, station M(2). A single specimen, slightly damaged, was collected. It is 47 mm in length, with 32 setigers of which at least 27 bear branchiae (starting at segment 2). There are only 1 or 2 preanal achaetous setigers. This is only the second record of this species from British Columbia.

Distribution: Northwestern Pacific, British Columbia. Subtidal to 105 m.

Northeastern Pacific Records: British Columbia (Hobson 1976)

CAPITELLIDAE

Capitella sp. *(capitata* -group). Cousins Inlet, July 1972, stations 0-6, 0-7; November 1975, station 0-7. A total of seven specimens of this species group, plus one fragment that could be identified only to genus, was collected.

In view of the work of Grassle and Grassle (1976), these specimens have not been assigned to *C. capitata* (Fabricius, 1780). A great deal of work is now necessary on reproductive patterns and life histories to determine the true status of each *C. "capitata"* population.

Mediomastus capensis Day, 1969. Cousins Inlet, July 1972,station 0-4A; December 1972, 0-3B, 0-4, 0-5; August 1974, 0-4; Swanson Bay, stations M and J, all samples. A total of ninety specimens was collected. The samples taken in 1972 at Ocean Falls included only one or two specimens each, but the sample taken in 1974 a station 0-4 had seven. In the Swanson Bay samples, this species proved to be the most abundant capitellid. All specimens are small, less than 0.5 mm in width. None is complete posteriorly. However, they agree well with Hobson's (1974) description of this species from Washington. This is only the second record of this species from British Columbia.

Distribution: Southern Africa, northeastern Pacific; British Columbia to Washington.

Intertidal to shelf depths.

Northeastern Pacific Records: British Columbia (Packman 1977), Washington (Hobson 1974, Armstrong et al 1976).

Notomastus lineatus Claparède, 1870. Swanson Bay station M(1-3). Four large anterior fragments, almost 2 mm in width, were found. This seems to be only the second or third record of this species from British Columbia since 1932.

Distribution: Atlantic, Mediterranean, Antarctic, Pacific; British Columbia to Southern California. Subtidal.

Northeastern Pacific Records: British Columbia (Berkeley and Berkeley 1932, 1952), Washington (Armstrong et al 1976), California (Hartman 1969).

MALDANIDAE

Clymenella sp. Cousins Inlet, December 1972, station O-4A. A single specimen in five fragments, totalling 18 setigers that appear to constitute an almost complete animal, were found in this sample. Overall, it is very similar to *Clymenella complanata* Hartman, 1969 but differs in the number of achaetous pre-anal segments. This material will form the basis of a more extensive study at a later time.

?Macroclymene sp. *sensu* Banse and Hobson, 1968. Swanson Bay station M(2), J(1,2). The four badly fragmented specimens all possess cephalic plates similar to those illustrated by Banse and Hobson, and the structure of the setae matches. However, all are in poor condition. The largest specimen may comprise 34 segments, including three preanal asetigers, but the fragmented condition of the animals renders the count questionable.

Praxillella spp. Swanson Bay, station M and J, all samples. Station M samples averaged ten specimens of this genus and those from station J, three. The fragmented condition of the specimens plus the presence of *Praxillella* -type anal cones with both three and four preanal achaetous segments, precluded the assignment of the fragments to any species.

SABELLARIIDAE

Idanthyrsus armatus Kinberg, 1867. Cousins Inlet, July 1972, stations O-3B, O-4; December

1972, 0-4A; August 1974, 0-4; Swanson Bay, M(1). The December 1972 samples from station 0-4A contained three specimens, the others, one each. The specimen from Swanson Bay was complete at 43 segments, approximately 40 mm in length.

There has been a certain amount of controversy as to whether there are one or two species of *Idanthyrsus* in the northeastern Pacific. Pettibone (1954) considered *I. ornamentatus* Chamberlin, 1919 to be conspecific with *I. armatus*. Hartman (1944b), however, considered them separate and distinct on the basis of the structure of the spinelets of the outer opercular paleae; those of *I. armatus* supposedly being more openly curved than those of *I. ornamentatus*. She considered *I. armatus* to be confined to the Chilean-Panamanian zone, with one record from Japan (Imajima and Hartman 1964) while *I. ornamentatus* ranged northward to Alaska.

Careful examination of our specimens reveals that the spinelets vary, in precisely the fashion described by Hartman (1944b), from dorsal to ventral on the same animal. This feature, therefore, does not appear to be a good character for separating species. However, Hobson and Banse (1981) use the structure of the thoracic paleae to separate the species, those of *I. armatus* being spoonshaped while those of *I. ornamentatus* are straight and abruptly tapering. On this basis, the present specimens are clearly *I. armatus*.

Although *I. ornamentatus* has been recorded from Alaska (Hartman 1948b, Reish 1965) and Oregon (Hartman and Reish 1950), it has not yet been recorded from British Columbia.
Distribution: North and South Pacific; from the Sea of Japan and Arctic Alaska to the subantarctic, Falkland Islands of South Georgia. Intertidal to 200 m.
Northeastern Pacific Records: Alaska (Berkeley and Berkeley 1942, Pettibone 1954, Feder et al 1973), British Columbia (Baird 1863 as *Sabellaria saxicava*, Cameron 1915 as *Pallasia saxicava*, E. Berkeley 1930 as *Pallasia johnstoni*, Berkeley and Berkeley 1942, 1952, 1956, Packman 1977), Washington (Pettibone 1954, Banse et al 1968).

AMPHARETIDAE

Ampharete finmarchica (M. Sars, 1865). Cousins Inlet, December 1972, station 0-4A; Swanson Bay, station M(2-5), J(2,3). All specimens are very small, less than 10 mm in length, but the majority are complete and agree well with the description of *A. arctica* Malmgren, 1866. This species is now regarded as a junior synonym of *A. finmarchica* (Sars) (Wesenberg-Lund 1950, Hartmann-Schroeder 1971, Holthe 1975). The only recorded difference between the

Atlantic and Pacific specimens of this species is the nature of the tips of the paleae: the Pacific ones are shorter, curved, and more abruptly tapered than those of the Atlantic specimens.

Distribution: Arctic, Northern Atlantic, North Pacific; Alaska to California. Subtidal to abyssal (4680 m, Hartman 1965).

Northeastern Pacific Records: Alaska (Moore 1908), British Columbia (E. Berkeley 1929, Berkeley and Berkeley 1942, 1952, Ellis 1967, 1968a, 1968b, 1969, Levings and Coustalin 1975), Washington (Pettibone 1956, Banse et al 1968), California (Hartman 1969). (All records refer to *A. arctica.)*

TEREBELLIDAE

Eupolymnia ?heterobranchia (Johnson 1901). Cousins Inlet, December 1972, station O-9. A single anterior fragment of about 12 segments has been tentatively assigned to this species on the basis of the distinctive branching gills and the structure of the setae and thoracic uncini. Hartman (1969) considered *Lanice heterobranchia* Johnson "too incompletely known to refer to any known species". However, Johnson describes and illustrates both the branchiae and the setae. The similarity of *E. crescentis* Chamberlin, 1919 to this species is obvious, and Berkeley and Berkeley (1950) suggested that it may be a variety of *E. heterobranchia*. The two species agree well in the structure of the gills but differ in that *E. heterobranchia* has three teeth in a triangular arrangement above the main fang of the uncini.

Distribution: Northeastern Pacific; British Columbia to Washington, possibly Alaska to Western Mexico. Sublittoral.

Northeastern Pacific Records: Alaska (Hartman 1948b, as *E. crescentis),* British Columbia (E. Berkeley 1929 as *E. nesidensis japonica,* Berkeley and Berkeley 1950, 1952, Levings and Coustalin 1975), Washington (Woodin 1974, Armstrong et al 1976), Oregon (Hartman and Reish 1950).

Lanassa venusta venusta (Malm, 1874). Swanson Bay, station M(1-5), J(1-3). Twenty-eight specimens of this species were collected from station M and two more from station J. All are well preserved, 8-10 mm in length, the eleven thoracic setigers making them easy to separate from other terebellids. This is only the second record of this species from British Columbia.

Distribution: Arctic, North Atlantic, North Pacific; Bering Sea, Washington. Sublittoral to 250 m.

Northeastern Pacific Records: British Columbia (Banse 1980), Washington (Banse et al 1968, Banse and Nichols 1968).

Lanassa venusta pacifica Annenkova, 1938. Swanson Bay, station M(1). One specimen of *Lanassa venusta* from this sample has twelve thoracic setigers; eye spots are visible on the cephalic ridge; and papillae are scattered over the dorsum of the first two segments. The capillary notosetae appear to be more finely serrated than those of the nominate subspecies.

Distribution: Northwestern Pacific; Sea of Japan. 15-30 m.

Northeastern Pacific Records: None, new to British Columbia.

Neoamphitrite edwardsi (Quatrefages, 1865). Cousins Inlet, December 1972, station 0-9. Five excellent specimens, three small (10 mm) and two larger (50 mm), were present in the sample. Branchial filaments are short and finely re-branching. Nephridial papillae are present on segments 3 to 11, as opposed to 3 to 14 in *N. robusta* (Johnson, 1901).

Distribution: Western Europe, South Atlantic, North Pacific; Japan, Washington. Sublittoral.

Northeastern Pacific Records: Washington (Banse et al 1968, Banse and Hobson 1968). New record for British Columbia.

Polycirrus sp. Swanson Bay, station M(1-5), J(1-3). More than fifty specimens of *Polycirrus* were found that correspond to the species described by Banse (1980) as *"Polycirrus* sp. III". This species was assigned to *P. kerguelensis* McIntosh, 1885 by Berkeley and Berkeley (1942, 1952); see Banse (1980) regarding its identification.

Distribution: British Columbia. Sublittoral.

Northeastern Pacific Records (as *P. kerguelensis):* British Columbia (Berkeley and Berkeley 1942, 1952, Bakkus 1966, Ellis 1967, 1968a, Banse 1980).

SABELLIDAE

Chone aurantiaca (Johnson, 1901). Swanson Bay, station M(2,4). Two specimens, one an anterior fragment of about 27 segments lacking a branchial crown, the other a shorter frag-

ment of nine segments with a brilliantly coloured crown found in the same sample. At the time of identification, both specimens still possessed orange and red colouring, particularly in the collar. They agree well with Banse's (1972b) description in all respects except the form of the abdominal uncini. In neither of the specimens does the main fang of the uncini extend beyond the base. In most cases, it is slightly shorter than the base. In the specimen with the crown, there are only two or three teeth above the main fang, while in the second, smaller (in diameter) specimen, there are three to four. The count does not seem to vary in the first twenty abdominal segments.

See Banse (1972a) for comments on the synonymy of this species.

Distribution: Washington. Intertidal.

Northeastern Pacific Records: Washington (Johnson 1901, Banse 1972b). New record for British Columbia.

Chone duneri Malmgren, 1867. Swanson Bay, station M(2). A single specimen consisting of an anterior fragment of 15 segments complete with a branchial crown was found. The specimen is about 15 mm long with the crown comprising about half this length.

Distribution: Arctic, North Atlantic, North Pacific; Alaska to Washington. Sublittoral to 1500 m.

Northeastern Pacific Records: Alaska (Reish 1965), Washington (Armstrong et al 1968, Banse 1972a). New record for British Columbia.

Euchone sp. Cousins Inlet, December 1972, station O-4. Three specimens that appear to be a distinct, but as yet unidentified species were found. Two specimens have 15 abdominal setigers, 6 of which are associated with the anal depression although the last setiger is represented only by two small uncini. The third specimen may be a juvenile; it is smaller, and has only 12 abdominal setigers. Its anal depression is virtually invisible and is associated with only one or two setigers. The larger specimens have glandular rings on the second thoracic setiger but no rings are visible on the smaller specimen. The segment count and form of the thoracic uncini of the larger specimens is close to *E. arenae* Hartman, 1966 from the Gulf of California but the specimens will require more careful study to establish their identity. Unfortunately, all lack the tentacular crown.

Jasmineira pacifica Annenkova, 1937. Cousins Inlet, December 1972, station O-9; August 1974,

station O-4; Swanson Bay, station M(1,2,4,5), J(1-3). There were 27 specimens collected from Ocean Falls with eight occuring in the sample from station O-9. The Swanson bay samples yielded 18 specimens, one each in the samples from station M, and 13 from station J. The specimens agree well with Banse (1979) with regard to the setae, and the large, ventrally flaring collar. Banse lists a tentative record from Drew Harbour, B.C., based on two fragments with regenerating lobes. This is the first confirmed record of the species from British Columbia.

Distribution: North Pacific; Sea of Japan to Washington. 25 to 2900 m.

Northeastern Pacific Records: British Columbia (Banse 1979, tentative), Washington (Banse 1979).

RESULTS AND DISCUSSION

A. Distribution and Abundance

To date, more than 300 invertebrate taxa have been identified in samples from Cousins Inlet and Swanson Bay. Polychaetes were numerous in nearly all samples and accounted for 29.5 to 59.6% of the individuals from the Swanson Bay samples and 50.0 to 93.2% from Ocean Falls (Table 9). A detailed tabulation of polychaete abundance is presented in Appendices A and B. Ninety-one species of polychaetes have been identified from Cousins Inlet and 126 from Swanson Bay. Specimens from other groups, especially Crustacea, are currently being examined by other investigators at the National Museum of Natural Sciences.

TABLE 9. *Percent of total numbers of individuals in samples accounted for by polychaete specimens. Numbers in parentheses are total number of organisms in samples.*

Swanson Bay

Station:	M1	M2	M3	M4	M5	J1	J2	J3
Polychaetes (%)	44.8	59.6	58.3	63.3	52.3	42.4	29.5	40.7
Total organisms	(1180)	(1402)	(444)	(1045)	(686)	(566)	(976)	(1191)

Cousins Inlet

Station:	0-3B	0-4	0-4A	0-5	0-6	0-7	0-8	0-9
Polychaetes (%)	93.2	80.0	72.8	50.1	80.3	93.8	50.0	86.4
Total organisms	(139)	(548)	(169)	(263)	(152)	(39)	(2)	(59)*

*off station sample, two samples on station were barren (see Table 1).

Replicate 2 from station M at Swanson Bay produced the most diverse collection of polychaetes, yielding 71 species. Replicate 4 followed closely with 64 polychaete taxa. At Cousins Inlet, station 0-4, located about mid-way along the length of the fjord yielded the most polychaete taxa of this study area (59 species in four samples; Appendix B). Stations in Ocean Falls Harbour usually yielded no or very few polychaetes or organisms of any group.

The small qualitative grab samples obtained from the lifeboat stations at Ocean Falls were examined in detail from surveys of December 1972 (16 samples) and November 1975 (17 samples). No organisms were observed in 1972, but a few specimens (1 to 3 individuals) of polychaetes in unidentifiable condition were recorded at three harbour stations in 1975. In

addition, technical personnel conducting the survey in August 1974 recorded capitellid polychaetes in five samples from the harbour area. Unfortunately these samples were not properly preserved and the observations cannot be verified. Packman (1976) dove with the PISCES IV submersible in Ocean Falls harbour in October 1976. He observed *Capitella* sp. in "grey and black patches" scattered over the fibre bed. The polychaete tubes extended a few centimetres above the sediment surface.

Samples from July and December 1972 at Cousins Inlet provided the most complete information and hence statistical analyses focussed on this data set. Polychaete abundance data from Stations 0-3B, 0-4, 0-5, 0-6, 0-7 and 0-8 were standardized so that sample volumes were comparable, normalized with $\log_{10}(x+1)$ transformation, and subjected to a 2-way analysis of variance to test for time and station effect. Station effects were significant ($p<0.05$), but time effects were not (Table 10). Graphical analysis indicated that the number of polychaete species and number of individuals decreased towards the head of the inlet (Fig. 4). As mentioned above, an abrupt discontinuity east of Coolidge Point was the most evident trend in the distribution of all fauna. A 2-way analysis of variance was also performed on the number of polychaete species, and once again the station effect was significant but time was not (Table 10).

TABLE 10. *Analyses of variance ($\log_{10}(x + 1)$ transformation) on polychaete abundance data (standardized for volume of sample) (upper panel) and number of polychaete species (lower panel) from Cousins Inlet. Data from July and December 1972 and Stations 0-3B, 0-4, 0-5, 0-6, 0-7, and 0-8 were used.*

*indicates $p<0.05$; NS indicates $p>0.05$.

Effect	Abundance d.f.	Analysis F. ratio
Time	1	0.30 NS
Station	5	7.75*
Error	5	
Total	11	

Species Analysis

Effect	Abundance d.f.	Analysis F. ratio
Time	1	2.62 NS
Station	5	9.33*
Error	5	
Total	11	

It is probable that sediment conditions were physiologically limiting for most of the polychaete species in Ocean Falls Harbour. Near bottom D.O. levels in the Harbour were generally higher than 1.5 mg^{-1} which is adequate for many species of polychaetes (Davis 1975). However, very little natural sediment was observed in this area and only species which could utilize wood waste as a substrate could settle and survive. Levels of H_2 were not measured but the presence of sulfides in a strong reducing environment could be inferred by smell. We believe that the interstitial water in the sediments was probably totally anoxic.

TABLE 11. *Factors influencing colonization of benthic habitats at Swanson Bay and Cousins Inlet.*

PARAMETERS	SWANSON BAY	COUSINS INLET (HEAD)
Years since reduction in wood output	52 (complete shutdown)	7 (partial closure)
Years of operation	18 (sulfite/sawmill)	55 (kraft & sulfite)
Shape of wood particles	coarse sawdust	string-like fibres; fine paper waste
Present oxygen levels in vicinity of wood deposits	4.1 to 9.0 mg L^{-1}	2.1 to 9.4 mg L^{-1}
Hydrogen sulfide	absent	present
Depth (m)	45 to 66	20 to 90
Currents	tidal streams; 2 to 4 kts.	surface currents from river runoff; 1 kt.
Stratification (estuarine circulation)	reduced	extensive
Natural sediment supply	moderate (tide swept shell debris & sand)	low (landslides only)
Sill	absent	present (minor amplitude)
Position in relation to open sea (source of larvae)	on a channel between two sounds	head of fjord
Recovery status based on infaunal benthos (polychaetes)	complete (ca. 126 species) but note dominance of a spionid	incomplete; (ca. 1 species) spionids and capitellids adjacent to azoic portion
Prospect for immediate re-establishment of benthic communities	good	poor

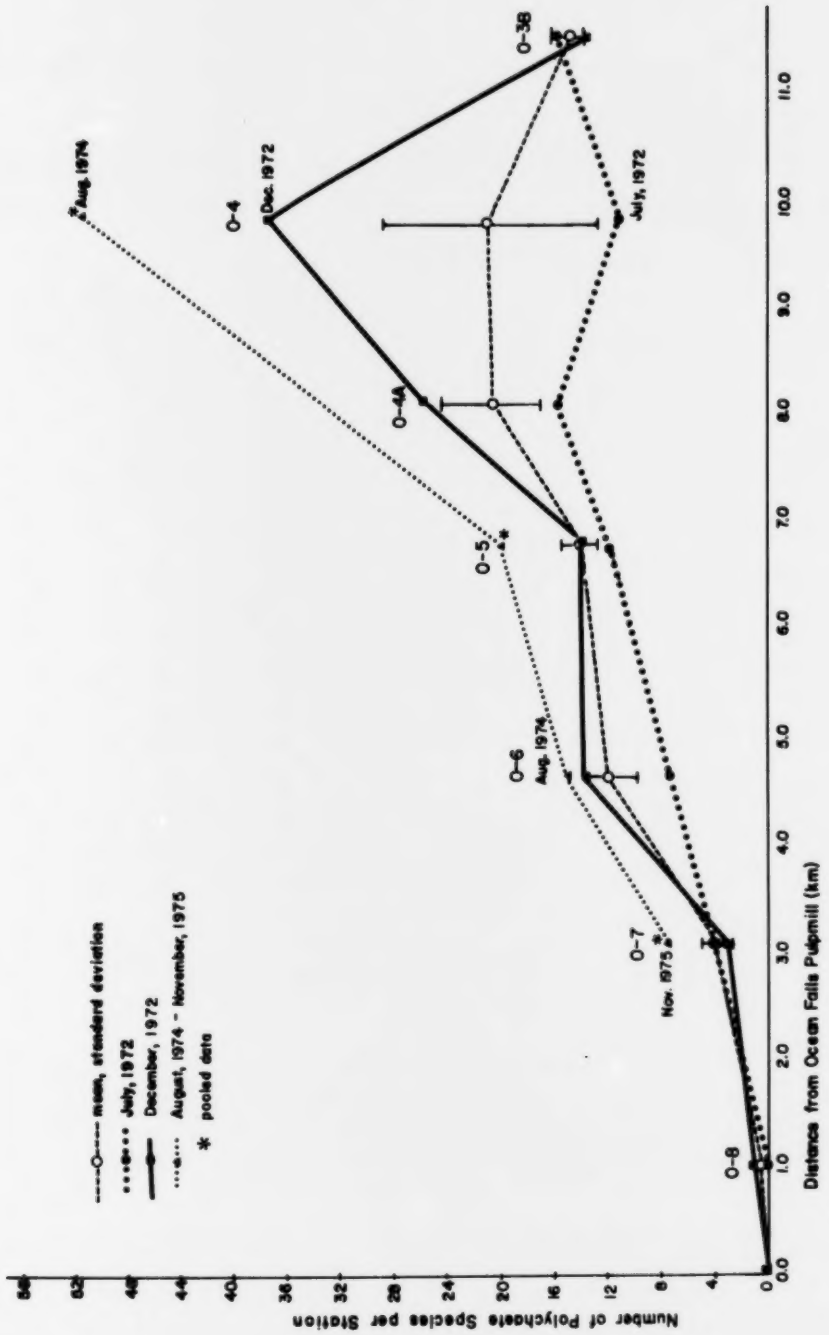

FIGURE 4: *Increase in number of Polychaete species with distance from head of Cousins Inlet*

The effect of pulp mill fibre deposition on benthic communities including polychaetes, has been documented from other locations on the B.C. coast (e.g. Prince Rupert (Packman 1977)), eastern Canada (Peer 1972), and in Europe (Pearson 1975). Our data on distributional trends between taxa, such as the abundance of opportunistic Capitellidae (eg. *Heteromastus filobranchus, Capitella* spp.) closer to the source of organic pollution, have also been shown by some of these authors. Pearson and Rosenberg (1978) provided a thorough review of macrobenthic succession in sediments polluted by organic material.

Sediments at Swanson Bay also contained wood waste but the material was well mixed with natural sand and shell brought into the bay by strong tidal currents. There was no evidence of H_2 in the sediments. Judging from the extremely high number of polychaete species observed, the habitats have been completely recolonized.

A comparison of some of the important factors governing recolonization at the two locations is shown in Table 11. Sediment supply, D.O., H_2, currents, and source of larvae are probably the most relevant, and on this basis Ocean Falls has very poor prospects for recovery of benthic communities in the harbour area. The burial of the polluted sediments in Ocean Falls harbour is impaired by the very slow rate of natural sedimentation, partly due to the presence of the dam on the Link River, and consequent reduction of the input of riverine sediments. This lack of natural sedimentation will probably restrict polychaete recolonization of the harbour for many years. In 1980, the pulp mill at Ocean Falls was completely closed down, and the opportunity exists to verify this prediction in years to come.

The remarkable deposits of faecal pellets in bottom sediments near Coolidge Point (Stations O-8, O-9) are worthy of mention. Up to approximately 80% of the volume of sediments in grab samples consisted of these pellets, which were cylindrical, about 0.5 to 1.0 mm in length, 0.2 mm in diameter, and were encased by an obvious membrane. It is possible that these were capitellid faecal pellets, as similar shaped pellets were often observed in the intestinal tract of animals from the study area. When the pulp mill was fully operational, the area around Coolidge Point was a transition habitat, possibly utilized by capitellids much as the inner harbour sediments are at present. Waldichuck (1962; Fig 9) showed bottom D.O. values began to increase above 0.1 mg L^{-1} at approximately station O-8. How the pellets are preserved remains to be established, as it would be expected that the faecal material would be biodegradable. Similar concentrations of faecal pellets have been observed (by C.D.L.) in other B.C. fjords characterized by low D.O. levels (i.e., Saanich Inlet, Neroutsos Inlet and Alberni Inlet).

Detailed comparisons of our study with others is difficult because of variation in sampling techniques. Of particular concern is the fact that most workers have not sorted their samples through sieves with mesh size smaller than 1.0 mm, even though it has been known for some time that this large mesh does not retain the majority of taxa (e.g. Reish 1959a). Packman (1977) used 0.5 mm mesh, the same size as in our work, in his study at Prince Rupert harbour, about 200 km north of Cousins Inlet. His faunal list of polychaetes showed 45 species (49.5%) in common with Cousins Inlet but only 10 species (7.9%) in common with Swanson Bay. Since Packman's (1977) samples were from an embayment with sediment and water characteristics quite similar to Cousins Inlet, including stress from pulp mill effluents, the similarity in fauna is to be expected. Other relatively comprehensive surveys to the north and south of British Columbia have used 1.0 mm mesh or larger. Feder et al (1973) sampled several types of benthic habitats in Prince William Sound, Alaska, and approximately 50 species were common to both our study areas. Banse et al (1968) sampled in Puget Sound, Washington and found 83 species that were also taken in our work.

Our data from Swanson Bay strongly suggest that the infauna of tide-swept channels in B.C. are among the most diverse benthic communities yet reported. For example, each of three grabs from Station M yielded over 60 species of polychaetes per sample with about 1200 individuals of all taxa. This is comparable to the polychaete and mollusc diversity of deep sea samples as shown by a comparison of our data with those of Sanders (1968, Table 3). Using an epibenthic sled (0.4 mm mesh) in the deep sea on muddy substrates, he found about 65 species of polychaetes and molluscs totalling approximately 800 specimens. In part, the high diversity of polychaetes may be explained by the heterogeneity of sediments at Swanson Bay, characterized by wood debris, sand, and crushed shells. More studies of the infauna of Swanson Bay or other similar locations are required to determine other possible reasons for the development of such rich benthic communities.

B. Taxonomy and Range Extensions:

The 166 species of polychaetes collected from Cousins Inlet and Swanson Bay have been listed with their known distributions in Appendix C. Of these species, 30 appear to be new to British Columbia, and six others may be new to science, although two of these are similar to species from California.

The new distribution records may be broken down as follows:

1. *Filler Records:*

   a. Known from Alaska and Washington: *Cattyana treadwelli, Goniada maculata, Chone duneri,* possibly *Cossura longocirrata,*

   b. Known from Alaska and California: *Hesperonoe adventor, Eteone californica, Tharyx monilaris.*

   c. Known from northwestern Pacific and Washington: *Pionosyllis uraga, Neoamphitrite edwardsi,* possibly *Jasmineira pacifica.*

2. *Range Extensions:*

   a. Known from Washington to California: *Gyptis brevipalpa, Sphaerosyllis brandhorsti,* possibly *Lumbrineris californiensis, Lumbrineris pallida, Cossura modica.*

   b. Known from the Atlantic, Washington and California: *Sigambra tentaculata, Drilonereis longa, Streblospio benedicti.*

   c. Known only from Washington (Puget Sound): *Exogone molesta, Magelona berkeleyi, Chaetozone acuta, Tharyx secundus, Tharyx serratisetis,* possibly *Macroclymene* (?) sp., *Chone aurantiaca.*

3. *New Records for the Northeastern Pacific:*

   a. Known from the Atlantic, Arctic and/or northwestern Pacific: *Arcteobia anticostiensis, Arcteobia spinielytris, Sigalion mathildae, Lanassa venusta pacifica.*

   b. Known only from California: *Tharyx tessalata.*

The most important factor involved in these new records and range extensions is that, although they reflect the known distribution of these species, they do not necessarily bear any relationship to the real distributions. The Polychaete fauna of Southern California is much more thoroughly researched than that of any other area on the Pacific Coast of North America. Puget Sound has recently been the subject of an extensive survey (Lie et al, 1968), while the Berkeleys did a great deal of work in certain areas of British Columbia. In most cases, the emphasis has been on larger species collected from the intertidal and shallow subtidal zones, and smaller worms from deeper waters are virtually unknown.

It should also be noted that the polychaete fauna of Canada is very poorly defined. Some species described as new by early workers are now regarded as conspecific with species described from Europe and Asia. Other species that now bear old, established names may actually belong to species-complexes. A great deal of work will be necessary to determine the true status of many of these records. At the moment, we can only record what we have

found in relation to the work of others in the area and adjacent biogeographical zones, and try to avoid confusing the issue further.

One other factor that is becoming more generally recognized, is the introduction of foreign species into a new area by ship traffic. Banse (1981) records *Clymenella torquata* (Leidy, 1855) from Boundary Bay, British Columbia. This area was well studied by the Berkeleys, and the species is a fairly large one. Banse (1981) suggests that this species may have been introduced with Atlantic oyster stocks planted in Boundary Bay in the first of part of this century.

The polychaete fauna of Swanson Bay includes four species that were originally described from Japan and the northwestern Pacific: *Pionosyllis uraga, Travisia japonica, Asclerocheilus beringianus* and *Lanassa venusta pacifica*. Although most of these were found only once, or in a few samples, *Pionosyllis uraga* was surprisingly abundant, being found in all samples for a total a thirty-one specimens. It was described from Japan only in 1966, and has since been recorded from Puget Sound, so one must exercise caution with such a spotty distribution; it may be only a coincidence that the major portion of the ship traffic to the Swanson Bay mill was from Japan. It would appear that this population has persisted at least forty years in isolation on the other side of the Pacific from its point of origin. It is possible that the relatively enriched conditions in this area have contributed to the longevity of this population. There were no specimens of the congeneric *Pionosyllis gigantea* Moore, 1908, which was originally described from southeastern Alaska and Queen Charlotte Sound and is common in other collections from this area in the National Museums of Natural Sciences.

The situation from Ocean Falls is much less clear-cut. *Tharyx tesselata* has previously been recorded only from California, by Hartman (1960), where it appears to be relatively wide-spread. Unfortunately, the taxonomic status of this species is uncertain, pending a long-overdue revision of the genus. Two other species, *Clymenella* nr. *complanata* Hartman, 1969 and *Euchone* nr. *arenae* Hartman 1966, could also be Californian introductions, but both require more study, and again, belong to genera requiring work. Perhaps, again, the preponderance of Californian ship traffic to Ocean Falls is just a coincidence, but it will be interesting to watch for changes in the population as conditions improve due to the closure of the mill, and there is no further means of influx of "foreign" stock.

Two other notable species, *Nereis (Eunereis) wailesi* and *Spio butleri*, were originally identified and described by Berkeley and Berkeley (1954) from the waters of British Columbia,

and have not been reported since prior to our investigations. We suspect that *N. wilesi*, at least, is more common than previously indicated as another specimen was collected from southeastern Alaska in 1980 by a National Museum of Natural Sciences expedition under the leadership of Dr. E.L. Bousfield.

Many of the other formerly 'rare' species are small forms. These are being found more often in diverse localities as more and more researchers use a 0.5 mm sieve to sort their material. There is also a paucity of literature on the deep water (over 50 m) polychaetes of British Columbia. The use of a 0.5 mm sieve to sort samples from deeper waters is believed to be responsible for the appearance of large numbers of smaller syllids, lumbrinerids, paraonids, cirratulids, spionids and capitellids from Ocean Falls and Swanson Bay. In the case of the spionid, *Spiophanes bombyx*, the smaller mesh retained enough material to demonstrate the numerical dominance of this species, whereas 1.0 mm mesh would have lost all but a few of the very largest specimens. This phenomenon was most evident in the Ocean Fall samples where filtrates from the 1.0 and 0.5 mm seives were analysed separately. One sample from station 0-4, collected August 19, 1974, contained 20 specimens of seven species that were retained on the 1.0 mesh, and 240 specimens of 36 species, on the 0.5 mm mesh. Only two species from the smaller mesh were also present, though few in number, in the 1.0 mm filtrate.

Compared to the polychaete fauna of Canada's Arctic and Atlantic coastal waters, that of British Columbia could be considered reasonably well researched. This is primarily due to the extensive work of Edith and Cyril Berkeley, covering a period of nearly fifty years (1923-1972). More recent work by others, particularly Katherine Hobson and Karl Banse, has focussed on a number of problem groups such as the Syllidae and Paraonidae which include many small species.

There remains one portion of the polychaete fauna of British Columbia for which no documentation exists. We have here reported on the sublittoral polychaete fauna of a small, active bay and a still, deep-water fjord that have had their original populations and substrates strongly altered as a consequence of human enterprise. While the process of recovery of these areas can be regarded as an interesting study, we have no basic data from similar areas that are still in a relatively untouched "virgin" state, on which to draw for comparison purposes. It is hoped that such a study can be carried out in the near future.

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APPENDIX A

Total number of specimens of each species in samples from stations in Cousins Inlet and Ocean Falls Harbour. Dates: a, July 1972; b, December 1972; c, August 1974; d, November 1975. (b, offstation, see Table 1).*

		Station							
		3B	4	4A	5	6	7	8	9
	dates sampled:	a/b	a/b/c	a/b	a/b/c	a/b/c	a/b/c/d	a/b	a/b*/c
SPECIES	sample volume (L):	8/5	10/15/7	10/3	10/10/10	3.5/15/10	3.5/15/8/10	3.5/3.5	-/2/-
POLYNOIDAE									
Harmothoe imbricata		-/-/	-/-/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/3/
Harmothoe lunulata		-/-/	-/-/1	-/-/	-/-/-	1/-/-	-/-/-/-	-/-/	-/-/
Harmothoe sp.		-/-/	-/1/-	-/1/	-/-/-	-/1/-	-/-/-/-	-/-/	-/-/
Hesperonoe adventor		-/-/	-/-/1	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/
Lepidonotus squamatus		-/-/	-/1/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/
PHOLOIDIDAE									
Pholoides aspera		1/-/	14/4/8	1/4/	-/-/3	-/-/2	-/-/-/-	-/-/	-/-/
SIGALIONIDAE									
Pholoe minuta		-/4/	-/2/6	-/3/	-/-/2	-/-/-	-/-/-/-	-/-/	-/-/
PHYLLODOCIDAE									
Eteone longa		1/-/	-/-/-	-/1/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Phyllodoce sp.		-/-	-/-/1	-/-	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
HESIONIDAE									
Gyptis brevipalpa		-/-/	-/1/-	-/-/	-/1/1	-/-/-	-/2/-/-	-/-/	-/-/-
PILARGIIDAE									
Sigambra tentaculata		-/-/	-/-/	-/-/	2/1/1	-/1/7	1/-/-/8	-/-/	-/1/-

APPENDIX A (cont.)

SPECIES	Station							
	3B	4	4A	5	6	7	8	9
SYLLIDAE								
Exogone sp.	1/1/	-/3/3	-/1/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Exogone molesta	-/-/	-/-/1	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Exogone verrugera	-/-/	-/-/2	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Syllis heterochaeta	1/-/	-/7/-	-/2/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Syllis sp.	-/-	-/1/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/2/-
NEREIDAE								
Nereis (N.) procera	-/-/	-/-/1	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Nereis (Eunereis) wailesi	-/-/	-/-/1	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Nereis sp.	-/-/	-/2/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
NEPHTYIDAE								
Nephtys cornuta cornuta	-/-/	-/-/2	-/-/	-/-/2	-/-/2	-/-/-/-	-/-/	-/-/-
Nephtys cornuta franciscana	4/5/	-/2/-	1/-/	1/1/-	1/-/-	6/3/-/-	-/1/	-/5/-
Nephtys ferruginea	-/-/	-/-/1	1/-/	-/-/-	-/-/1	-/-/-/-	-/-/	-/-/-
Nephtys punctata	-/-/	1/-/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Nephtys sp.	-/-/	-/-/1	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
SPHAERODORIDAE								
Sphaerodoropsis sp.	-/1/	-/-/1	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
GLYCERIDAE								
Glycera capitata	-/1/	-/1/2	-/-/	1/2/2	-/-/-	-/-/-/-	-/-/	-/-/-
Glycera sp.	-/-/	-/-/-	1/-/	-/-/1	-/1/-	-/-/-/-	-/-/	-/-/-

APPENDIX A (cont.)

SPECIES	Station 3B	4	4A	5	6	7	8	9
GONIADIDAE								
Glycinde armigera	-/-/	-/1/2	-/-/	-/-/2	-/-/1	-/-/-/-	-/-/	-/-/-
ONUPHIDAE								
Onuphis (Nothria) conchylega	-/-/	-/1/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Onuphis (Nothria) elegans	-/-/	-/-/1	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Onuphis (Nothria) geophiliformis	-/-/	-/-/-	1/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Onuphis (Nothria) iridescens	-/-/	-/-/1	-/1/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
LUMBRINERIDAE								
Lumbrineris bicirrata	-/-/	1/1/-	-/-/	1/-/-	-/-/1	-/-/-/-	-/-/	-/-/-
Lumbrineris sonata	1/-/	1/1/12	3/-/	-/-/-	1/-/-	-/-/-/-	-/-/	-/-/-
Lumbrineris sp.	-/-/	-/2/1	1/2/	-/-/-	1/-/-	-/-/-/-	-/-/	-/-/-
Ninoe gemmea	-/-/	-/-/1	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
ARABELLIDAE								
Drilonereis longa	-/-/	1/-/1	-/-/-	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
DORVILLEIDAE								
Dorvillea sp.	1/-/	-/-/2	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/1/-
Protodorvillea gracilis	-/-/	-/-/-	-/2/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Schistomeringos annulata	-/-/	-/-/-	-/-/	1/1/-	-/-/4	-/1/-/-	-/-/	-/-/-
ORBINIIDAE								
Scoloplos armiger	-/-/	-/-/-	-/-/	-/1/-	-/-/-	-/-/-/-	-/-/	-/-/-
Scoloplos pugettensis	-/1/	-/-/-	-/-/	1/1/2	-/1/1	-/-/-/-	-/-/	-/-/-

APPENDIX A (cont.)

SPECIES	Station 3B	4	4A	5	6	7	8	9
PARAONIDAE								
Aricidea lopezi	-/-/	-/-/9	-/1/	1/4/13	-/1/7	-/-/-/-	-/-/	-/-/-
Aricidea neosuecica	6/11/	1/18/67	22/5/	-/-/1	-/1/-	-/-/-/-	-/-/	-/-/-
Aricidea quadrilobata	-/1/	-/-/1	-/-/	-/-/-	-/1/-	-/-/-/-	-/-/	-/-/-
Aricidea ramosa	1/-/	-/-/4	5/-/	-/1/3	-/-/1	-/-/-/-	-/-/	-/-/-
Paraonis gracilis	3/1/	-/-/15	8/5/	3/-/3	-/4/1	-/-/-/-	-/-/	-/-/-
SPIONIDAE								
Laonice cirrata	-/-/	-/-/5	-/-/	-/-/3	-/-/8	-/-/-/2	-/-/	-/1/-
Microspio sp.	-/-/	-/-/4	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Polydora caulleryi	-/-/	-/1/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Prionospio (Minuspio) cirrifera	-/-/	-/-/1	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Prionospio sp.	-/5/	-/2/-	-/-/	-/-/-	-/-/-	-/-/-/1	-/-/	-/-/-
Prionospio steenstrupi	-/-/	-/-/24	6/2/	-/-/4	-/-/3	-/-/-/1	-/-/	-/-/-
Spiophanes berkeleyorum	-/-/	-/-/-	-/-/	-/-/-	-/-/-	-/-/-/1	-/-/	-/-/-
Spiophanes kroyeri	1/-/	-/-/-	-/-/	-/-/-	-/-/-	-/-/-/1	-/-/	-/-/-
Spiophanes sp.	-/-	-/-/1	-/-	1/-/-	-/-/-	1/-/-/-	-/-/	-/-/-
Streblospio benedicti	-/-/	-/-/-	2/-/	-/-/-	1/-/-	-/-/-/-	-/-/	-/-/-
MAGELONIDAE								
Magelona longicornis	-/-/	-/-/2	-/1/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
CHAETOPTERIDAE								
Spiochaetopterus costarum	-/-/	-/4/-	-/1/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-

APPENDIX A (cont.)

SPECIES	Station 3B	4	4A	5	6	7	8	9
CIRRATULIDAE								
Chaetozone setosa	-/-/	-/3/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Chaetozone sp.	-/2/	-/-/2	-/2/	-/-/-	-/-/	-/-/-/-	-/-/	-/-/-
Cirratulus cirratus spectabilis	-/-/	-/-/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/1/-
Tharyx multifilis	1/-/	-/-/-	-/-/-	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Tharyx tessalata	-/-/	-/10/25	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Tharyx sp.	3/4/	-/2/9	-/2/	-/1/3	-/2/4	-/-/-/-	-/-/	-/3/-
COSSURIDAE								
Cossura longocirrata	-/-/	-/1/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Cossura modica	-/-/	-/3/-	-/-/	1/2/9	-/3/-	-/-/-/-	-/-/	-/-/-
FLABELLIGERIDAE								
Pherusa plumosa	-/-/	-/-/1	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
SCALIBREGMIDAE								
Asclerocheilus beringianus	-/-/	-/-/-	-/1/	-/-/-	-/-/-	-/-/-/-	-/-/	-/2/-
OPHELIIDAE								
Ophelina breviata	-/-/	-/1/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	
Travisia brevis	-/-/	-/1/6	3/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
CAPITELLIDAE								
Capitella sp. "*capitata-group*"	-/-/	-/-/-	-/-/	-/-/-	1/-/-	1/-/-/6	-/-/	-/-/-
Barantolla americana	-/-/	-/-/-	-/-/	-/-/-	-/1/-	-/-/-/-	-/-/	-/-/-

APPENDIX A (cont.)

SPECIES	Station							
	3B	4	4A	5	6	7	8	9
Decamastus gracilis	-/1/	1/1/3	3/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Heteromastus filiformis	-/-/	-/-/-	-/-/	-/1/-	1/26/1	-/-/-/-	-/-/	-/-/-
Heteromastus filobranchus	-/-/	-/-/-	-/-/	12/10/13	-/-/-	-/-/-/-	-/-/	-/-/-
Heteromastus sp.	-/-/	1/-	-/-/	-/-/-	-/-/-	1/-/-/-	-/-/	-/-/-
Mediomastus capensis	-/1/	-/-/7	1/10/	-/1/-	-/-/-	-/-/-/-	-/-/	-/-/-
MALDANIDAE								
Clymenella sp.	-/-/	-/1/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Maldane glebifex	-/-/	-/3/3	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Notoproctus pacificus	-/-/	5/4/4	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Rhodine bitorquata	-/-/	-/2/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
OWENIIDAE								
Myriochele oculata	-/-/	-/-/7	-/5/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Owenia fusiformis	-/-/	-/-/1	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
SABELLIARIIDAE								
Idanthyrsus armatus	2/-/	1/3/1	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
PECTINARIIDAE								
Pectinaria californiensis	-/-	-/-	-/-/	-/-/1	-/1/-	-/-/-/-	-/-/	-/-/-
Pectinaria granulata	-/-/	-/-/1	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Pectinaria moorei	-/-/	-/1/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-

APPENDIX A (cont.)

SPECIES	Station							
	3B	4	4A	5	6	7	8	9
AMPHARETIDAE								
Amage anops	-/-/	-/-/-	-/-/	-/-/-	1/-/-	-/-/-/-	-/-/	-/1/-
Ampharete finmarchica	-/-/	-/1/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Amphicteis mucronata	-/-/	-/1/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Lysippe labiata	-/-/	-/4/1	1/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Melinna cristata	-/-/	-/-/1	-/-/	1/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
TEREBELLIDAE								
Amphitrite cirrata	-/-/	-/-/1	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Eupolymnia heterobranchia	-/-/	-/-/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/1/-
Neoamphitrite edwardsi	-/-/	-/-/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/5/-
Pista brevibranchiata	-/-/	-/-/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/1/-
Pista cristata	-/-/	-/4/-	-/1/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Pista sp.	1/-/	-/-/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Polycirrus californicus	-/-/	-/-/-	-/-/	-/-/1	-/-/-	-/-/-/-	-/-/-	-/1/-
Thelepus hamatus	-/-/	-/5/1	-/1/	-/-/-	-/-/-	-/-/-/-	-/-/-	-/-/-
TRICHOBRANCHIDAE								
Terebellides stroemi	1/-/	-/-/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
SABELLIDAE								
Euchone analis	-/-/	-/-/3	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Euchone incolor	-/-/	-/1/-	-/4/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
Euchone sp.	-/-/	-/-/-	-/1/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-

APPENDIX A (cont.)

SPECIES	Station 3B	4	4A	5	6	7	8	9
Jasmineira pacifica	-/-/	-/-/1	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/8/-
Potamilla intermedia	-/-/	1/-/-	-/-/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-
SERPULIDAE								
Serpula vermicularis	-/-/	-/-/-	-/1/	-/-/-	-/-/-	-/-/-/-	-/-/	-/-/-

SUMMARY	3B	4	4A	5	6	7	8	9
a. July 19-20, 1972: number of samples	1	1	1	1	1	1	1	1
number of Polychaete species	16	11	16	12	7	4	0	0
total number of Polychaetes	29	28	60	26	7	9	0	0
total number, all taxa	54	56	91	59	17	11	1	0
Percentage of Polychaetes/all taxa	53.7	50.0	65.9	44.1	44.2	81.8	-	-
b. December 3-4, 1972: number of samples	1	1	1	1	1	1	1	1
number of Polychaete species	14	38	26	14	14	3	1	15*
total number of Polychaetes	39	104	64	28	46	6	1	36
total number, all taxa	85	179	78	92	83	6	1	59
Percentage of Polychaetes/all taxa	43.8	58.1	82.1	30.4	55.4	100	100	61.0

*off station (see text)

APPENDIX A (cont.)

SUMMARY	3B	4	4A	5	6	7	8	9
c. August 18-19, 1974 number of samples	n.s.	3	n.s.	2	1			1
number of Polychaete species		58		30	15	n.s.	n.s.	0
total number Polychaetes		263		70	44			0
total number, all taxa		313		112	52			0
percentage Polychaetes/all taxa		84.0		62.5	84.6			
d. November 19, 1975 number of samples	n.s.	n.s.	n.s.	n.s.	n.s.	3	n.s.	n.s.
number of Polychaete species						7		
total number of Polychaetes						20		
total number, all taxa						22		
percentage of Polychaetes/all taxa						90.9		
Total number of samples	2	5	2	4	3	5	2	3
mean number species/sample	15	21	21	14	12	3	0.5	5
standard deviation	1	16	7	2	4	2	0.7	9

APPENDIX B

Estimated total number of specimens per grab (adjusted to 100%) of each Polychaete species in replicate samples from Swanson Bay stations M & J.

Sample	M1	M2	M3	M4	M5	J1	J2	J3
Subsample size	50%	45%	70%	75%	80%	50%	50%	70%
Species								
POLYNOIDAE								
Arcteobia anticostiensis					1			
Arcteobia spinielytris	2							
Gattyana ciliata				1				
Gattyana cirrosa	6			4		2		
Gattyana treadwelli					2			
Harmothoe extenuata	4	4		3	1			3
Harmothoe lunulata		2		3				
Harmothoe multisetosa					1			
Harmothoe sp.							2	
Lepidonotus squamatus		2						
PHOLOIDIDAE								
Pholoides aspera	6	16	3	1			4	1
SIGALIONIDAE								
Pholoe minuta	26	33	23	20	4	4	16	14
Sigalion mathildae							2	
Sthenelais berkeleyi	2							
EUPHROSINIDAE								
Euphrosine bicirrata			1					
PHYLLODOCIDAE								
Eteone californica	6			1	2		4	4
Eteone longa	8	20	11	23	15	12	8	20
Genetyllis castenea		4						
Phyllodoce groenlandica	8							
Phyllodoce mucosa				3	1			7

APPENDIX B (continued)

	M1	M2	M3	M4	M5	J1	J2	J3
LACYDONIIDAE								
Unidentified species				3				
HESIONIDAE								
Kefersteinia cirrata		4	3					
SYLLIDAE								
Autolytus sp.								1
Exogone lourei								1
Exogone molesta					1			
Exogone verrugera								1
Exogone sp.	4							
Odontosyllis phosphorea	14	20	4	9	10	2	2	9
Pionosyllis uraga	2	4	7	7	7	4	10	7
Sphaerosyllis brandthoresti				1				
Sphaerosyllis pirifera		4	10	4	1	2	2	
Syllis (Typosyllis) alternata	4	18	10	5	4		10	11
Syllis (Typosyllis) armillaris								1
Syllis (Ehlersia) heterochaeta	26	7	7	8	10	6	4	13
NEPHTYIDAE								
Nephtys caeca			1		1			
Nephtys feruginea	2	4	3	3	1		2	1
SPHAERODORIDAE								
Sphaerodoropsis minuta	2							1
Sphaerodoropsis sphaerulifer			1					
Sphaerodorum papillifer		4		1				
GLYCERIDAE								
Glycera capitata		6		1	1	2		4
Glycera sp.			1					
Hemipodus borealis				1				
GONIADIDAE								
Glycinde picta	2							
Goniada maculata		2	1	3				

APPENDIX B (continued)

	M1	M2	M3	M4	M5	J1	J2	J3
ONUPHIDAE								
Onuphis (Nothria) conchylega		27	6	9	19	6	12	15
Onuphis (Nothria) iridescens	10	9		5	1	6		4
EUNICIDAE								
Eunice kobiensis		2						1
LUMBRINERIDAE								
Lumbrineris bicirrata				1				
Lumbrineris californiensis	8							
Lumbrineris cruzensis	2	7	4					
Lumbrineris pallida				8	4		4	
Lumbrineris sp.								10
ARABELLIDAE								
Drilonereis longa		2						
DORVILLEIDAE								
Dorvillea pseudorubrovittata	14	2	6	7	5			3
Protodorvillea gracilis	2	20	3	11	4	8	6	10
Schistomeringos longicornis	2	11	3	8	4	4	2	
ORBINIIDAE								
Scoloplos armiger			1					
Scoloplos pugettensis		2						
Scoloplos sp.				4				
PARAONIDAE								
Aricidea lopezi	2	4		3			4	
Aricidea neosuecica	4	4		1	5		4	6
Paraonis gracilis							2	1
SPIONIDAE								
Laonice cirrata	8	4				2		1
Polydora caulleryi							2	1
Prionospio steenstrupi							4	6
Pygospio elegans	4	7		1			2	

APPENDIX B (continued)

	M1	M2	M3	M4	M5	J1	J2	J3
SPIONIDAE								
Scolelepis foliosa		2						3
Spio butleri								13
Spio cirrifera		22		1	5	4	6	24
Spio filicornis		9	1	8	1			7
Spio sp.	2							
Spiophanes bombyx	142	258	58	297	114	82	90	150
MAGELONIDAE								
Magelona berkeleyi		2				2		
Magelona longicornis	18	22	4	16	16	16		24
SPIOCHAETOPTERIDAE								
Spiochaetopterus costarum	14	4		1	6		2	3
CIRRATULIDAE								
Caulleriella alata		2				2		
Chaetozone acuta	2			1	1			
Chaetozone berkeleyorum		2		3				
Cirratulus cirratus spectabilis				1				
Tharyx monilaris					1			
Tharyx secundus	2	7	1					
Tharyx serratisetis					1			
Tharyx sp.							2	
FLABELLIGERIDAE								
Brada villosa					1			
Pherusa plumosa	2	9	3	5	4			3
SCALIBREGMIDAE								
Scalibregma inflatum	6	4	1	11	5	8	4	4
OPHELIIDAE								
Armandia brevis	2	11	3	31	4	2	8	14
Ophelina breviata	10	9		4	10	6	6	23
Travisia japonica		2						

APPENDIX B (continued)

	M1	M2	M3	M4	M5	J1	J2	J3
CAPITELLIDAE								
Barantolla americana							2	
Decamastus gracilis	6	16	4	19	6	4	2	7
Mediomastus capensis	20	31	18	24	10	6	22	10
Notomastus lineatus	2	7	1					
MALDANIDAE								
Axiothella rubrocincta	12	13	4	4	3	2		1
Clymenura columbiana	2			1	1			
?Macroclymene sp.		4				2		
Maldanella robusta	2							
Nicomache personata	2	2		1		2	2	1
Notoproctus pacifica	2	2	4	1		6	2	
Praxillella spp.	20	16	14	12	14	4	8	4
Rhodine bitorquata	2						2	
OWENIIDAE								
Myriochele oculata	2	4	1	7			6	3
Owenia fusiformis	2	4			1	2		
SABELLARIIDAE								
Idanthyrsus armatus						2		
PECTINARIIDAE								
Pectinaria californiensis		4						
Pectinaria granulata				1	6		2	1
AMPHARETIDAE								
Amage anops		2						
Amphicteis mucronata					1			
Ampharete finmarchica		7	4	3	1		2	6
Asabellides lineata		4						1
Lysippe labiata	2							1
Schistocomus hiltoni		2						

APPENDIX B (continued)

	M1	M2	M3	M4	M5	J1	J2	J3
TEREBELLIDAE								
Lanassa venusta pacifica	2							
Lanassa venusta venusta	14	13	1	8	10	2		1
Pista brevibranchiata	2	2	1					
Pista cristata	2			1				1
Polycirrus californicus	2	14	1				4	
Polycirrus sp.	26	20	7	9	14	4	2	13
TRICHOBRANCHIDAE								
Terebellides stroemi	2	2	1					
Trichobranchus glacialis	4	7		8	4	2	2	1
SABELLIDAE								
Chone aurantiaca				1				
Chone duneri		2						
Chone ecaudata		9	1	1	1			6
Euchone analis	12	24		9	9	2	2	3
Jasmineira pacifica	4	2	1	1	2	8	6	
Megalomma spendida		11		1				
Myxicola infundibulum	2							1
Potamilla intermedia		1						
Sabella (Demonax) media		4	3	7	1	14	2	4
Total number of polychaete species in each sample	61	71	44	64	55	36	44	59
Estimated total number of polychaetes per sample	527	836	259	661	359	210	288	485
Estimated total number of all taxa per sample	1180	1402	444	1045	686	566	976	1191
Percent of sample composed of polychaetes	44.7	59.6	58.4	63.3	52.3	37.1	29.5	40.7

*APPENDIX C: Known distribution of Polychaete species from Cousins Inlet and Swansons Bay, British Columbia (*indicates further information in systematics section of text). See page for definition of geographical zones.*

	THIS COLLECTION		PREVIOUS RECORDS		
	Cousins Inlet	Swanson Bay	North-west Pacific	Eastern Bering Sea, S. Alaska	British Columbia
POLYNOIDAE					
*Arcteobia anticostiensis**		+	+		
*Arcteobia spinielytris**		+	+		
Gattyana ciliata		+	+	+	+
Gattyana cirrosa		+	+	+	+
*Gattyana treadwelli**		?		+	
Harmothoe extenuata	+	+	+	+	+
Harmothoe imbricata	+		+	+	+
Harmothoe lunulata	+	+			+
Harmothoe multisetosa		+		+	+
*Hesperonoe adventor**	+			+	
Lepidonotus squamatus	+	+	+	+	+
PHOLOIDIDAE					
Pholoides aspera	+	+		+	+
SIGALIONIDAE					
Pholoe minuta	+	+	+	+	+
*Sigalion mathildae**		+	+		
*Sthenelais berkeleyi**		?			+
EUPHROSINIDAE					
Euphrosine bicirrata		+	+	+	+
PHYLLODOCIDAE					
*Eteone californica**		+		+	
Eteone longa	+	+	+	+	+
Genetyllis castanea		+	+		+
Phyllodoce groenlandica		+	+	+	+

PREVIOUS RECORDS (cont.)						
Wash.	Oregon	Calif.	Mexico South America	Arctic	North Atlantic	Depth Distribution
				+	+	5-630 m
				+		3-591 m
+				+		10-550 m
+				+	+	Littoral - 1000 m
+						20-30 m
+		+		+	+	Littoral - 2000 m
+	+	+		+	+	Littoral - 4000 m
+	+	+		+	+	Littoral - 900 m
+	+	+		+		Littoral - 2500 m
		+				Littoral - 200 m
+	+	+	+	+	+	Littoral - 2500 m
+	+	+	+			Littoral - 350 m
+	+	?	+	+	+	Littoral - 2000 m
					+	Low water - 120 m
+		+				Littoral - 110 m
		+				Littoral - 700 m
		+				Littoral - 50 m
+				+	+	Low water - 1700 m
+	+	+				Low water - 500 m
+	+	+		+	+	Low water - 1500 m

APPENDIX C (continued)

	THIS COLLECTION		PREVIOUS RECORDS		
	Cousins Inlet	Swanson Bay	North-west Pacific	Eastern Bering Sea, S. Alaska	British Columbia
Phyllodoce mucosa[1]		+		+	+
HESIONIDAE					
Gyptis brevipalpa[1]	+				
Kefersteinia cirrata[1]		+			+
PILARIIDAE					
Sigambra tentaculata[1]	+				
SYLLIDAE					
Autolytus sp.*		+			
Exogone lourei		+			+
Exogone molesta[1]	+	+			
Exogone verrugera	+	+	+		+
Exogone sp.*	+	+			
Odontosyllis phosporea		+	+		+
Pionosyllis uraga[1]		+	+		
Sphaerosyllis brandthorsti[1]		+			
Sphaerosyllis pirifera		+			+
Syllis (Typosyllis) alternata		+	+	+	+
Syllis (Typosyllis) armillaris		+	+	+	+
Syllis (Ehlersia) heterochaeta	+	+	?		+
NEREIDAE					
Nereis (N.) procera	+			+	+
Nereis (Eunereis) wailesi[1]	+				+

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PREVIOUS RECORDS (cont.)

Wash.	Oregon	Calif.	Mexico South America	Arctic	North Atlantic	Depth Distribution
		+		+	+	Littoral - 245 m
+		+	+			Sublittoral - 200 m
					+	Littoral - 250 m
					+	Littoral - 5000 m
+						Sublittoral - 150 m
						27-40 m
+		+				Sublittoral - 150 m
+						27-40 m
		+		+[1]	+	Low water - 150 m
+	+	+				Littoral - 150 m
+					+	20-150 m
+			+			Sublittoral - 264 m
+		+				Littoral - 300 m
+		+				Littoral - 2500 m
+	+	+	+	+	+	Littoral - 400 m
+		+				50-700 m
+	+	+				Sublittoral
						Unknown

APPENDIX C (continued)

	THIS COLLECTION		PREVIOUS RECORDS		
	Cousins Inlet	Swanson Bay	North-west Pacific	Eastern Bering Sea, S. Alaska	British Columbia
NEPHTYIDAE					
Nephtys caeca		+	+	+	+
Nephtys cornuta cornuta[4]	+			+	+
Nephtys cornusta franciscana[4]	+				+
Nephtys ferruginea	+	+			+
Nephtys punctata	+			+	+
SPHAERODORIDAE					
Sphaerodoropsis minuta		+	+	+	+
Sphaerodoropsis sphaerulifer		+	+		+
Sphaerodoropsis sp.	+				
Sphaerodorum papillifer		+			+
GLYCERIDAE					
Glycera capitata	+	+	+	+	+
Glycera sp.*	+	+			
Hemipodus borealis		+		+	+
GONIADIDAE					
Glycinde armigera	+		+	+	+
Glycinde picta		+		+	+
Goniada maculata[4]		+	+	+	
ONUPHIDAE					
Onuphis (Nothria) conchylega	+	+	+	+	+
Onuphis (Nothria) elegans	+				+
Onuphis (Nothria) geophiliformis	+		+	+	+
Onuphis (Nothria) iridescens	+	+	+	+	+
EUNICIDAE					
Eunice kobiensis[4]		+	+	+	+

PREVIOUS RECORDS (cont.)						
Wash.	Oregon	Calif.	Mexico South America	Arctic	North Atlantic	Depth Distribution
+	+	+		+	+	Littoral - 600 m
+	+					Littoral - 50 m
+		+				Sublittoral - 50 m
+	+	+	+			Sublittoral - 500 m
+	+	+		+[1]		Sublittoral - 900 m
+		+		+	+	Sublittoral - 100 m
+		+				Sublittoral - 250 m
		+				Sublittoral - 1250 m
+	+	+	+	+	+	Low water - 3500 m
+	+	+				Littoral - 75 m
+	+	+	+			Low water - 500 m
+						18-60 m
+				+	+	Low water - 2300 m
		+		+	+	Low water - 4000 m
+	+	+				Littoral - 67 m
	+	+	+			Sublittoral - 350 m
+	+	+	+			Sublittoral - 2400 m
+	+					Littoral - 350 m

APPENDIX C (continued)

	THIS COLLECTION		PREVIOUS RECORDS		
	Cousins Inlet	Swanson Bay	Northwest Pacific	Eastern Bering Sea, S. Alaska	British Columbia
LUMBRINERIDAE					
Lumbrineris bicirrata	+	+		+	+
Lumbrineris californiensis[4]		?			
Lumbrineris cruzensis		+			+
Lumbrineris pallida[4]		+			
Lumbrineris zonata		+		+	+
Ninoe gemmea	+				+
ARABELLIDAE					
Drilonereis longa[4]		+			
DORVILLEIDAE					
Dorvillea pseudorubrovittata		+		+	+
Schistomeringos annulata[4]	+				+
Schistomeringos longicornis[4]		+			+
Protodorvillea gracilis		+			+
ORBINIIDAE					
Scoloplos (S.) armiger	+	+	+	+	+
Scoloplos (L.) pugettensis[4]	+	+	+	+	+
PARAONIDAE[2]					
Aricidea lopezi	+	+	+		+
Aricidea neosuecica[4]	+	+			+
Aricidea quadrilobata	+		+		+
Aricidea ramosa[4]	+		+		+
Paraonis gracilis[4]	+	+	+	+	+

2. See page 28.

PREVIOUS RECORDS (cont.)						
Wash.	Oregon	Calif.	Mexico South America	Arctic	North Atlantic	Depth Distribution
+	+	+	+			Sublittoral - 2500 m
+		+	+			10-400 m
+	+	+	+			Sublittoral - 2000 m
+		+	+			Sublittoral - 140 m
+	+	+	+			Littoral - 450 m
+	+	+	+			70-1300 m
+		+			+	Littoral - 2475 m
+	+					15-135 m
+			+			45-264 m
+	+	+	+			Low water - 575 m
+	+	+	+			Littoral - 1000 m
+	+	+	+	+	+	Low water - 2000 m
+	+	+	+	+?		Littoral - 500 m
+	+	+	+?			6-1100 m
	+	+			+	16-4749 m
				+	+	5-5680 m
	+	+				44-2400 m
+	+	+	+	+	+	10-3860 m

APPENDIX C (continued)

	THIS COLLECTION		PREVIOUS RECORDS		
	Cousins Inlet	Swanson Bay	Northwest Pacific	Eastern Bering Sea, S. Alaska	British Columbia
SPIONIDAE					
Laonice cirrata	+	+	+	+	+
Microspio sp.*	+				
Polydora caulleryi[4]		+			+
Prionospio (Minuspio) cirrifera	+	+	+	+	+
Prionospio steenstrupi	+	+	+	+	+
Pygospio elegans		+	+		+
Scololepis foliosa		+		?	+
Spio butleri[4]		+			+
Spio cirrifera		+			+
Spio filicornis		+	+	+	+
Spiophanes berkeleyorum	+				+
Spiophanes bombyx[4]		+	+	+	+
Streblospio benedicti[4]	+	+			
MAGELONIDAE					
Magelona berkeleyi[4]		+			
Magelona longicornis	+	+			+
SPIOCHAETOPTERIDAE					
Spiochaetopterus costarum	+	+	+		+
CIRRATULIDAE[3]					
Caulleriella alata		+			+
Chaetozone acuta[4]		+			

3. See page 32.

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PREVIOUS RECORDS (cont.)						
Wash.	Oregon	Calif.	Mexico South America	Arctic	North Atlantic	Depth Distribution
+	+	+	+	+	+	Subtidal-Abyssal
+				+[1]	+	Littoral - 200 m
+	+	+	+	+	+	Littoral - 2500 m
+	+	+	+	+	+	Littoral - 2750 m
+		+		+	+	Littoral-sublittoral
	+	+			+	Littoral - 20 m
						Littoral - 66 m
+						Littoral - 66 m
+		+		+	+	Littoral - 400 m
						Littoral - 457 m
+	+	+			+	Littoral - 119 m
+		+			+	Littoral
+						32-40 m
+						Littoral - 197 m
+		+			+	Low water-shelf (100 m)
+		+	+		+	Littoral-sublittoral
+						20-40 m

APPENDIX C (continued)

	THIS COLLECTION		PREVIOUS RECORDS		
	Cousins Inlet	Swanson Bay	North-west Pacific	Eastern Bering Sea, S. Alaska	British Columbia
Chaetozone berkeleyorum		+			+
Chaetozone setosa	+		+	+	+
Cirratulus cirratus spectabilis[4]	+	+		+	+
Tharyx monilaris[4]		?		+	
Tharyx multifilis	+			+	+
Tharyx secundus[4]		+			
Tharyx serratisetis[4]		+			
Tharyx tessalata[4]	+				
COSSURIDAE					
Cossura longocirrata	+		+	+	
Cossura modica[4]	+				
FLABELLIGERIDAE					
Brada villosa		+	+	+	+
Pherusa plumosa	+	+	+	+	+
SCALIBREGMIDAE					
Asclerocheilus beringianus[4]	+		+		
Scalibregma inflatum		+	+	+	+
OPHELIIDAE					
Armandia brevis		+		+	+
Ophelina breviata	+	+		+	+
Travisia brevis	+		+	+	+
Travisia japonica[4]		+	+		+
CAPITELLIDAE					
Capitella sp. "capitata-group"[4]	+		+	+	+
Barantolla americana	+	+			+
Decamastus gracilis	+	+			+

PREVIOUS RECORDS (cont.)

Wash.	Oregon	Calif.	Mexico South America	Arctic	North Atlantic	Depth Distribution
+						Littoral - 84 m
+	+	+	+	+	+	Littoral - 556 m
+	+	+				Littoral
		+	+			Sublittoral-basin
+	+	+	+			Littoral-sublittoral
+						Sublittoral - 20 m
+						Littoral
		+				Sublittoral
+	+			+	+	Littoral - 887 m
	+					
+	+	+		+	+	Low water - 1500 m
+	+	+		+	+	Low water - 2000 m
+						57-5018 m
+	+	+	+	+	+	Low water - 2500 m
+	+	+				Littoral-sublittoral
	+			+		Sublittoral 2200 m
+	+	+	+			20-2500 m
						Sublittoral - 105 m
+	+	+	+	+	+	Low water - 900 m
+		+		+	+	Littoral - 3753 m
+		+				45-755 m

APPENDIX C (continued)

	THIS COLLECTION		PREVIOUS RECORDS		
	Cousins Inlet	Swanson Bay	North-west Pacific	Eastern Bering Sea, S. Alaska	British Columbia
Heteromastus filiformis	+		+	+	+
Heteromastus filobranchus	+				+
Mediomastus capensis[1]	+	+			+
Notomastus lineatus[1]		+			+
MALDANIDAE					
Axiothella rubrocincta		+		+	+
Clymenella sp.*	+				
Clymenura columbiana		+		+	+
Macroclymene sp.*		?			
Maldane glebifex	+			+	+
Maldanella robusta		+		+	+
Nicomache personata		+	+	+	+
Notoproctus pacificus	+	+		+	+
Praxillella sp.*		+			
Rhodine bitorquata	+	+		+	+
OWENIIDAE					
Myriochele oculata	+	+	+	+	+
Owenia fusiformis	+	+	+	+	+
SABELLARIIDAE					
Idanthyrsus armatus[1]	+	+	+	+	+
PECTINARIIDAE					
Pectinaria californiensis	+			+	+
Pectinaria granulata	+	+	+	+	+
Pectinaria moorei	+		+	+	+

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PREVIOUS RECORDS (cont.)

Wash.	Oregon	Calif.	Mexico South America	Arctic	North Atlantic	Depth Distribution
	+	+		+[1]	+	Littoral - 4680 m
+		+				Sublittoral
+						Littoral - 100 m
+	+	+			+	Sublittoral
+	+	+				Littoral - 100 m
+						Sublittoral
+						
+	+	+				Sublittoral - 1420 m
+		+				Sublittoral - 160 m
+		+		+	+	Low water - 1000 m
+	+	+				Sublittoral-Abyssal
+	+	+				Sublittoral-Bathyl
+	+(?)			+		2-680 m
+	+		+	+	+	Littoral - 5000 m
+		+	+	+		Littoral - 200 m
+	+	+				Sublittoral - 100 m
+	?	?		+	+	Low water - 350 m
		+				20-2900 m

APPENDIX C (continued)

	THIS COLLECTION		PREVIOUS RECORDS		
	Cousins Inlet	Swanson Bay	North-west Pacific	Eastern Bering Sea, S. Alaska	British Columbia
AMPHARETIDAE					
Amage anops	+	+		+	+
Amphicteis mucronata	+	+			+
Ampharete finmarchica[1]	+	+	+	+	+
Asabellides lineata		+		+	+
Lysippe labiata	+	+	+	+	+
Melinna cristata	+		+	+	+
Schistocomus hiltoni		+			+
TEREBELLIDAE					
Amphitrite cirrata	+		+	+	+
Eupolymnia heterobranchia[1]	?			?+	+
Lanassa venusta pacifica[1]		+	+		
Lanassa venusta venusta[1]		+	+		+
Neopamphitrite edwardsi[1]	+		+		
Pista brevibranchiata	+	+		+	+
Pista cristata	+	+	+	+	+
Polycirrus californicus	+	+			+
Polycirrus sp.*		+			+
Thelepus hamatus	+	+		+	+
TRICHOBRANCHIDAE					
Terebellides stroemi	+	+	+	+	+
Trichobranchus glacialis		+	+	+	+
SABELLIDAE					
Chone aurantiaca[1]		+			

1. J. Wacasey (Pers. Comm.)

PREVIOUS RECORDS (cont.)						
Wash.	Oregon	Calif.	Mexico South America	Arctic	North Atlantic	Depth Distribution
+	+	+				Sublittoral
+	+	+	+			Sublittoral - 1000 m
+		+	+(?)	+	+	Sublittoral - 4680 m
+		+		+[1]		Sublittoral
				+	+	Sublittoral - 900 m
	+			+	+	Sublittoral - 4000 m
+	+	+		+		Sublittoral
+		+		+[1]	+	Low water - 3000 m
+	?+	?		+		Sublittoral
						15-30 m
+				+	+	Sublittoral - 250 m
+					+	Sublittoral
+		+	+			Littoral - 1000 m
+	+	+		+	+	Sublittoral - 1000 m
+		+				Littoral - 500 m
						Sublittoral
		+	+			Sublittoral - 1500 m
+	+	+	+	+	+	Low water - 3000 m
+	+			+	+	Sublittoral - 2800 m
+						Littoral

APPENDIX C (continued)

	THIS COLLECTION		PREVIOUS RECORDS		
	Cousins Inlet	Swanson Bay	Northwest Pacific	Eastern Bering Sea, S. Alaska	British Columbia
*Chone duneri**		+	+		
Chone ecaudata		+	+	+	+
Euchone analis	+	+	+	+	+
Euchone incolor	+		+	+	+
Euchone sp.*	+				
*Jasmineira pacifica**	+	+	+		+?
Megaloma splendida		+		+	+
Myxicola infundibulum		+	+	+	+
Potamilla intermedia	+	+	+	+	+
Sabella (Demonax) media		+	+	+	+
SERPULIDAE					
Serpula vermicularis	+		+	+	+

PREVIOUS RECORDS (cont.)						
Wash.	Oregon	Calif.	Mexico South America	Arctic	North Atlantic	Depth Distribution
+				+	+	Sublittoral - 1500 m
		+				Sublittoral
	+	+		+	+	Sublittoral - 700 m
+		+	+		+	15-81 m
+						25-2900 m
+	+	+	+			Sublittoral
+		+		+	+	Low water - 525 m
+		+	+	+	+	Littoral - 735 m
	+	+				Littoral
+	+	+	+	+	+	Littoral - 1400 m

RECENT SYLLOGEUS TITLES / TITRES RECENTS DANS LA COLLECTION SYLLOGEUS

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